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The Effects of the Property Tax Extension Limitation Law Adjustment and Hold Harmless Provision on Equity in the Illinois General State Aid Funding System, 2000 - 2011

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THE EFFECTS OF THE PROPERTY TAX EXTENSION LIMITATION LAW ADJUSTMENT AND HOLD HARMLESS PROVISION ON EQUITY IN THE ILLINOIS GENERAL STATE AID FUNDING SYSTEM, 2000–2011

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This research analyzed the effect that the General State Aid (GSA) Property Tax Extension Limitation Law adjustment and Hold Harmless component had on equity in the Illinois General State Aid funding system. The equity criteria defined in the study were permissible variance, wealth neutrality, and conditional wealth neutrality. This study consisted of four simulations. First, baseline indices were calculated for the Illinois GSA funding system for 2000 to 2011. Second, the Property Tax Extension Limitation Law adjustment (PTELL) was eliminated, the associated cost savings used to increase the GSA foundation level, and new equity indices were calculated. Third, the Hold Harmless component was eliminated, the associated cost savings were used to increase the foundation level, and new equity indices were calculated. Finally, the PTELL adjustment and Hold Harmless component were both eliminated, the combined cost savings were used to increase the GSA foundation level, and new equity indices were calculated. The simulated indices were compared to the

baseline values to determine the effect on equity.

The permissible variance criterion was measured using the Mcloone Index and coefficient of variation. A simple regression coefficient was used to measure the wealth neutrality criterion. Finally, the conditional wealth neutrality criterion was measured using the change in R^2 from a 2-step multiple regression (controlling for local tax rate).

Some major findings of the study included:

1. Unit school districts were more equitable than elementary and high school districts across all equity measures and simulations.

2. High school districts were the least equitable of all school district types.

3. The simulations that included the elimination of the PTELL adjustment improved the equity in the Illinois funding system across all measures and school district types.

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CHAPTER I

STATEMENT AND ANALYSIS OF THE PROBLEM

The United States Constitution specified certain responsibilities and functions of the federal government. It did not address education. The responsibility for providing education to the residents of the country was clarified by the Tenth Amendment.

> The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people (the Constitution of the United States of America).

The education of residents is necessary for an informed citizenry and participation in a democratic society. Therefore, the responsibility for education was delegated to the individual states. According to Wise (1972):

> Education is a function of the state. From this it follows that the state acting through its legislature or its constitution may retain unto itself the necessary authority to maintain and operate schools, or it may delegate such authority to other agencies. . . . (p. 100)

Education requires funding. Because all states specify education as a primary responsibility in their constitutions, theoretically, 50 different school funding systems may exist throughout the nation. As a primary function of the state, public education is funded in various ways. Many states have relied on local property tax revenue to fund education. However, local municipalities are not equal in their capacity to pay for public education. As a result, funding disparities across school districts emerged and continued to grow larger. Most states have

experienced problems in trying to equalize education funding for all students. Illinois is among those states for which legislators have attempted to create mechanisms for funding school districts equitably.

Researchers and legislators tend to focus on state interventions for public education within their state, but the federal government has also contributed to policy making for education. For more than 40 years, the federal government has been concerned with issues pertaining to special assistance for poverty students (Elementary and Secondary Act of 1965), obtaining equality of education for all persons (Coleman Report, 1966; National Institute of Education), assessing the achievement progress of all students in the nation (Contract with ECS to create NAEP in 1969), funding appropriate services for students with disabilities (Special Education Act of 1975), and in 2001 further attempting to assess/monitor student achievement with the passage of the law entitled No Child Left Behind (NCLB). Although it seems that the federal government tends to be interested in special policy issues instead of general ones, Wise (1979) quoted Joseph M. Cronin, first appointed State Superintendent of Education of Illinois, as writing:

> The pleas for “local control” or the slogan, “education belongs to the states,” may be uttered, even shouted, back home. But slowly, inexorably, and incrementally, the federal government is taking over education. Especially since 1965, the country has moved—almost every year—toward a national system of education. Furthermore, the potential opposition has almost conceded the inevitability of the trend. (p. 50)

Usually state and school district personnel do not resist receiving federal money; however, the critics charge that either the amount is insufficient to achieve the

purpose of the mandate or there are too many sanctions tied to the revenue. In Fiscal Year 2011, there was $28.1 billion dedicated to funding elementary and secondary education in Illinois. The federal government contributed 12.3% of the total amount; the state of Illinois provided 33.1%; and the local resources (property taxes and corporate personal property replacement taxes) provided 54.6%.

In reviewing the funding strategy used by the states, it appears that state leaders attempt to obtain as much from the federal government as they can, contribute what they have available from state sources to local school districts, and let local property taxes continue to fund education at an increasing rate. This is exactly the situation in Illinois. The disparity in per student spending in Illinois has continued to increase as local property tax revenue has continued to increase. For example, in Fiscal Year 2000 the range of per student spending for elementary school districts was $13,884 but increased to $18,902 in Fiscal Year 2011. Similarly, for high school districts, the range increased from $12,267 to $16,650 for the same two years. Unit school districts increased the least of the three district types by increasing to $10,907 from $7,596. Appendix A shows the minimum and maximum values by school district type.

In 1984, Berne and Stiefel published a text that defined various categories of equity principles (horizontal, vertical, and equal opportunity) and summarized various indices (e.g., range, restricted range, McLoone, coefficient of variation, etc.) for measuring student funding equity. General state aid formulas are usually designed to address horizontal equity, which is defined as the equal

treatment of equal students. The amounts generated by the various general state aid formulas are referred to as a basic funding amount per student. This basic amount precedes the addition of any categorical funding for students needing additional resources (e.g., special education, limited-English fluency, poverty, etc.). The purpose of categorical funding is designed to address vertical equity, which is the unequal treatment of unequal students. These categories of equity are discussed in more detail in this chapter.

In Illinois, many committees/commissions/task forces have been created to study school funding. Some of the more well-known reports include the Report of the Illinois Task Force on School Finance (January 1993), Report of the Governor's Commission on Education Funding for the State of Illinois (March 1996), and Recommendations for Systemic Reform of Funding for Elementary and Secondary Education in Illinois (Education Funding Advisory Board October 2002). Many times improved student funding equity has been a desired outcome. Although many reports have been produced, few of the proposed solutions have been implemented by the Illinois General Assembly to improve the equity of funding in its public school funding system. There seems to be two main reasons for this lack of action. The first is that the proposals can be very costly, and the legislators are unable to secure the funding. The second reason is the inability of legislators to agree on the best course of action. This failure to act has produced cynicism among school practitioners. The typical response given by school district personnel when a committee finalized a report was "here is another document for a bookshelf somewhere." Also, there have been many

lawsuits generated regarding inequitable funding, which resulted in several states being ordered by the court to reform their school finance systems. Some of the states most notable for court ordered reform are California, Kentucky, Ohio, New York, West Virginia, Wyoming, and most recently Kansas in March 2014.

Five lawsuits have been brought against the State of Illinois related to school funding. The first case was *McInnis v. Shapiro* in 1968. Arthur Wise published *Rich Schools, Poor Schools* in 1967. The question that Wise wanted to address was whether the Fourteenth Amendment (equal protection clause) of the United States Constitution could be used as a foundation in a lawsuit when there were unequal expenditures per pupil due to inequity in funding. The *McInnis v. Shapiro* lawsuit in Illinois was the first to test the theory set forth in *Rich Schools, Poor Schools.* The Illinois Supreme Court found in favor of the defendants, although it agreed that poorer districts should have additional funding and that the inequality in the system was a result of local control. The justices decided this issue should be resolved by the legislators and not the judges. The United States Supreme Court upheld the lower court's opinion.

The second case was *Blasé v. Illinois* in 1970. This lawsuit was based on the same premise as the first case, but the plaintiffs argued that the new 1970 constitution adopted by the State of Illinois had stronger language to support their lawsuit. According to the plaintiffs, the language in the new constitution required the State to have the primary responsibility for funding education. The reliance on the local property tax worked against equity in the funding system because property taxes were not uniformly distributed. Once again the court decided in

favor of the State of Illinois. The basis of the decision was that Article X of the Illinois Constitution was a goal and not a mandate.

The third lawsuit, *Committee v. Edgar*, found its way to the Illinois Supreme Court in 1996. The plaintiffs made similar arguments from the earlier cases but added the concept of "adequacy." The twist to this new argument was that the Illinois funding system did not provide the necessary resources for economically disadvantaged students. The court found that the State of Illinois was not in violation of the constitution and part of the basis for the decision was the notion of "local control." It was during this time period that the emphasis started to shift from equity to adequacy in Illinois. This shift also paralleled the economic decline in the states as they struggled with having sufficient money to pay for state services.

The fourth lawsuit, *Chicago Urban League v. State of Illinois*, was filed in 2008. There were two claims to the lawsuit. The first claim was based upon the Equal Protection Clause of the United States Constitution and the second was based on the Illinois Civil Rights Act. In April 2009, the first claim was dismissed but the second claim was left alive. The Urban League has not taken any further action.

The fifth lawsuit, *Carr v. Koch*, was filed in 2010. In this lawsuit, the complaint was also based on the Equal Protection Clause, but specifically regarding the local property tax structure. The court granted the motion to dismiss in 2010. The plaintiffs were unsuccessful in their appeal to the appellate court in 2011. In 2012, the Illinois Supreme Court granted the plaintiff's petition

for Leave to Appeal. The Illinois Supreme Court held that the complaint had been properly dismissed for lack of standing.

Problem

Funding of public school students in Illinois is not considered to be equitable. Two researchers, Professors Alan Hickrod and Ben Hubbard, conducted many seminal research studies through the Center for the Study of Education Finance at Illinois State University from 1973 to 1997. The majority of these studies focused on the equity (or lack of equity) of the Illinois GSA funding system. Education groups, legislators, school district administrators, and teachers have continued to pursue education funding reform for more than 30 years. The overriding themes for the various funding reform proposals have been increased student equity, less reliance on local property taxes, and a higher adequate level of funding. The concept of adequacy is defined as the necessary level of funding to allow students to achieve at a specific level. Although adequacy is an important concept in school finance, it is not addressed by this study. Equity is examined because the Illinois General State Aid formula is based upon an equalization of state and local funds, and it is important to analyze how well that equalization factor works.

In looking at how Illinois compares to other states, a 2007 survey conducted by Verstegen and Jordan (2009) indicated that all but five states distributed general state aid based upon an equalization formula. The five states that did not utilize an equalization formula were Connecticut, Hawaii, North Carolina, Vermont, and Wisconsin. Equalization formulas are attempts by states

to increase student equity by equalizing state and local resources. Even with these equalization formulas, Illinois and many other states continued to have a problem with equitable funding of students. Local resources outpace state resources, and the general state aid formulas are unable to achieve an equalized level. This is exactly the situation that has developed in Illinois. In 2010-2011, the local property tax revenues collected by school districts had grown to $15.4 billion and the state revenue appropriated for the Illinois General State Aid (GSA) formula was $4.6 billion, yet the total $4.6 billion for GSA has not been equalized in the formula. There are actually three parts to the GSA program. The first is the foundation formula (also includes an alternate method and flat grant), which cost $3.23 billion in Fiscal Year 2011, and is the only part of the program that is equalized. Second is the poverty grant formula that cost $1.35 billion in Fiscal Year 2011 and is a separate calculation to the foundation formula. Finally, the prior year audit adjustments cost $22 million in Fiscal Year 2011. This meant that in Fiscal Year 2011 the Illinois GSA formula attempted to equalize $3.23 billion in state revenue with $15.4 billion in local revenue. Local property wealth is not evenly distributed across the state, which only adds to the disparity and inequity. Some areas of the state have greater access to revenue-producing facilities, businesses, or other resources. The problem is not new and has been studied at great length over the last four decades. However, as adjustments (such as the Property Tax Extension Limitation Law adjustment or Hold Harmless component) are made to the GSA formula, it is important to measure how they affect the overall equity of the system.

Purpose

The purpose of this study was to investigate the impact that the Property Tax Extension Limitation Law (PTELL) adjustment and the Hold Harmless component of the General State Aid Formula have on the equity of the Illinois funding system. The timeline for the study was determined to be Fiscal Years 2000 to 2011. The two adjustments examined in this study have different timelines, which complicated the decision. The Hold Harmless component began with the revised General State Aid formula in Fiscal Year 1999 and was eliminated in Fiscal Year 2011. The Property Tax Extension Limitation Law (PTELL) adjustment was adopted in the General State Aid (GSA) Formula in 2000 and is still in existence. Since Fiscal Year 2000 is the first year that both adjustments were included in the GSA formula, the decision was to make that the beginning point for the study. The ending point was a little more complicated to determine. There were major decreases to the GSA appropriation in Fiscal Years 2012 and 2013. However, the foundation level was left at $6,119 rather than being reduced to fit the appropriation. That means the GSA formula was calculated with an unfunded level and then the final payments were prorated. Because this could skew the equity indices, it did not seem feasible to include those years in the study. Although the Hold Harmless component was eliminated in 2011, the PTELL adjustment had an associated cost of almost $700 million dollars, so it seemed logical to end the study with Fiscal Year 2011.

An equalization formula is used in Illinois to distribute state aid funds. Legislators adjust the formula from year to year to modify for a particular group of

students or in response to a specific issue. For example in Fiscal Year 2002, the General Assembly changed the pupil count used for GSA to be the higher of the current average daily attendance or the 3-year average. This modification to the formula helped school districts that had declining pupil counts. Also, there was a modification to the formula in Fiscal Year 2004 when the Department of Human Services poverty count replaced the Decennial Census poverty count. This modification was generally beneficial to school districts that had an increasing poverty student population by utilizing a more current student count. There have been two adjustments to the Illinois formula that are particularly interesting with respect to student equity. These adjustments are for PTELL and Hold Harmless. It is important to determine how these specific adjustments of the General State Aid formula affect equity because the intent of the system is to equalize state and local revenue. More detail is given for these adjustments later in this chapter.

In Illinois, PTELL is a new complication to an old equity problem. PTELL was passed in 1991 (35 ILCS 200/18-185) to address taxpayer complaints regarding substantial increases to local property taxes without voter approval of a tax referendum. PTELL limits the increase of local property tax revenues from one year to the next. Legislators complicated the equity situation by passing PTELL to limit the amount of local revenue that school districts can receive but adjusted state aid as an attempt to offset the local loss. Beginning in Fiscal Year 2000, Illinois' GSA formula was adjusted for PTELL. There has not been a study to determine what effect this PTELL adjustment had on the equity of the funding system in Illinois. This study purports to identify the effects on equity created by

the use of the PTELL adjustment.

The addition of the General State Aid Hold Harmless component began in Fiscal Year 1999. This component holds districts constant to the amount of GSA they received in Fiscal Year 1998 if the current year calculation yields less for them. Although the amount needed to fund the Hold Harmless component is much less than the amount for the PTELL adjustment, it still counteracts the equalization function of the GSA formula by providing additional funding apart from the equalization function.

Equity criteria, such as wealth neutrality (equal opportunity) and permissible variance (horizontal equity), are examined to see how well the funding system is working to achieve student equity. The concept of wealth neutrality refers to making school district expenditures (or revenues) less a function of district wealth. Permissible variance refers to reducing the disparity in expenditure per pupil among the school districts. The measures are compared with and without the PTELL adjustment and the Hold Harmless component in the GSA formula to examine what impact these adjustments have on equity.

Berne and Stiefel (1984), Guthrie, Garms, and Pierce (1988), Hickrod and Hubbard (1977), Hickrod and Chaudhari (1997), Odden (1992), Odden and Picus (1992), Wise (1972, 1979), and many others have conducted studies over the last three decades that have focused on the equity, or lack of equity, in various funding mechanisms. More recently, studies by Figlio (1995), Hylbert (2001), and Rudow (2003) investigated the effects of PTELL at the local level. Yet no studies have investigated the impact that the PTELL adjustment and GSA Hold

Harmless component have on equity in the Illinois funding system.

Illinois Funding Framework

This section describes the current funding system in Illinois that is examined in this study. The local side of the funding framework consists of the property tax system, corporate personal property replacement tax, and the PTELL Law. On the state side, there is General State Aid and General State Aid Hold Harmless. This section also contains the background of the Education Funding Advisory Board (EFAB). The Illinois statute (105 ILCS 5/18-8.05) established EFAB in 1997, and members were appointed in 2000. The statute has specific guidelines on how EFAB is to generate the foundation level recommendations to report to the General Assembly for Illinois public school districts.

Local Property Tax System

In Illinois, the main components of the local property tax system are equalized assessed valuation (EAV), tax rates, levies, and extensions. The property tax cycle for a school district begins with school district personnel filing a levy (request for money) for each taxable purpose (e.g., Educational, Transportation, Working Cash, Tort Immunity, IMRF, etc.). The county clerk finalizes the EAV for the school district and then calculates a tax rate for each purpose by dividing each individual levy by the EAV. The county clerk is responsible for ensuring that each resulting tax rate is not larger than the district's authorized rate for each purpose. Most of the tax purposes have a maximum rate either by statute or voter referendum. The tax extensions are calculated and then the tax bills are prepared and mailed to the taxpayers (Illinois

Department of Revenue website).

In areas of the state where there was rapid growth in EAV, the taxpayers saw higher tax bills each year without a voter referendum authorizing an increase to the tax rate. The impetus for the PTELL law was to limit those increases to normal inflation and slow down the increase in property taxes. Other aspects that complicate the local property tax system are Property Tax Appeal Board decisions, Certificate of Errors reports, tax increment financing districts, enterprise zones and the classification system in Cook County. These additional complications are beyond the scope of this study.

Property Tax Extension Limitation Law (PTELL)

The purpose of creating PTELL was to address the issue of large increases to property tax extensions (revenue that the school district receives from local property taxes). According to the Illinois Department of Revenue (IDoR),

> The PTELL slows the growth of property tax revenues to taxing districts when property values and assessments are increasing faster than the rate of inflation. As a whole, property owners have some protection from tax bills that increase only because the market value of their property is rising rapidly. (p. 7)

PTELL limits the increase to the annual property tax extension to 5% or the Consumer Price Index (CPI), whichever is less. The CPI has only been greater than 5% one time since PTELL was adopted and that was the first year (1991). The CPI has ranged from 0.1% to 4.1% since that first year (see Appendix B for the annual CPI values). Therefore, the CPI has been used as the inflation factor in the PTELL calculation for every year except 1991. Although this limitation has

been referred to as “tax caps,” that description is somewhat of a misnomer. It is not the amount of taxes, rates, or EAV that are capped but the *increase in the amount of property tax extension*.

County clerks calculate a limiting rate for each school district to enforce PTELL. The limiting rate is the maximum aggregate rate (not including any bonds that a district may have) that a district may extend. The general formula for the limiting rate is: previous year tax extension * (1+CPI)/current year adjusted EAV. If a school district passes a tax rate referendum, that will factor into the numerator of the limiting rate formula. The county clerk ensures that the aggregate rate resulting from the school district levy does not exceed the limiting rate (Illinois Department of Revenue, p. 14).

As a result of taxpayer pressure, legislators passed the PTELL to limit the increase of the property tax extension from one year to the next. However, because there is no provision in the PTELL statute to limit the growth of the EAV, a district may have a large increase to the EAV but not be able to access it with their aggregate local tax rate. As EAV increases the local tax rate decreases. If the tax extension is thought of as a constant, then the EAV and aggregate rate are variable. If the EAV increases, then the rate must decrease to yield the constant dollar amount, and vice versa.

PTELL was legislated for the collar counties (DuPage, Kane, Lake, McHenry, Will) in 1991 and for Cook County in 1994. All other county boards were allowed to place a referendum on the ballot to let the county residents decide whether they wanted the local governments of the county to be subject to

PTELL. Appendix C contains a list of Illinois counties that have taken action with respect to PTELL. According to the list, six counties had legislation passed that subjected them to PTELL, 33 of the remaining 96 counties passed PTELL from 1997 to 2003. There are 54 counties that have not voted on the issue and 9 counties where the referendum failed to pass. Since 2003, no referendums have been attempted.

PTELL has caused at least three problems for school districts. The first problem is that the district is limited in how much the tax extension is allowed to increase each year, and, therefore, the school district does not have the increase in property tax revenue as it once did. The second problem is that if district EAV is increasing at a rate higher than inflation then it is unable to utilize its authorized tax rate. Third, now that some districts have been subject to PTELL for more than 15 years, an unintended consequence is that many of the local school district tax rates have declined substantially. This is especially a problem in school districts where their extended rate is below the formula rate used in General State Aid (GSA). These districts may not receive as much local revenue as the GSA formula assumes.

Illinois General State Aid

Illinois has had a foundation formula since 1927 except for the years 1980–1998. During this time period the General Assembly implemented a guaranteed tax base formula. The guaranteed tax base included a constant valuation per pupil and tax rate by school district type. The basis of a foundation formula is a basic level amount (foundation level) that is guaranteed by a

combination of state and local funds. A foundation formula is utilized to equalize resources (state and local) and in theory the foundation level amount is an "adequate" or "minimum" level of funding. Although the variables used in the foundation formula are the same (pupil count, tax rate, EAV, and foundation level), there have been many different ways to define them. In prior formulas the pupil count was adjusted by grade level weightings (25% more for each high school student and 5% for each junior high student) and poverty count of pupils. Tax rates used in the formula have changed over time as well as the source of the poverty count of pupils. Also, earlier formulas did not have a foundation level specified in statute. Prior to Fiscal Year 1999, a state appropriation was made for the General State Aid formula, and when all of the data (pupil counts, EAVs, poverty counts, etc.) were finalized the foundation level was calculated. The current General State Aid formula has a foundation level that is specified in statute (105 ILCS 5/18-8.05) and the state appropriation should be based upon the amount of revenue necessary to fund that foundation level.

In Fiscal Year 1999, there was a major revision to the GSA formula. Instead of a guaranteed tax base, the GSA formula became a foundation formula, and many key parameters (pupil count, grade level weightings, poverty calculation, and formula tax rates) were changed. The new formula is based upon an unweighted best three months average daily attendance as the pupil count; the poverty students are accounted for in a separate formula; and there is a foundation level specified in statute. In Fiscal Year 2000, an adjustment for PTELL districts was added to the formula parameters. In Fiscal Year 2011, the

associated cost of the PTELL adjustment was almost $700 million dollars and the total cost associated with the adjustment from Fiscal Year 2000 to Fiscal Year 2011 was $5.14 billion.

Also in 1999, a Hold Harmless component was added in the statute for the new formula parameters. While the GSA Hold Harmless component was eliminated in Fiscal Year 2011, the total cost associated with the component from Fiscal Year 2000 to 2010 was $403.7 million. The Hold Harmless component states that if a school district's current calculation of GSA is less revenue than it received in Fiscal Year 1998 then a Hold Harmless payment will be made to make up the difference. In theory, this component is utilized to allow a school district time to adjust to a change in a funding formula. It was logical to include such a provision when there were major changes to the GSA formula in Fiscal Year 1999. However, no sunset provision (i.e., a date for terminating the provision) was provided in statute and so the Hold Harmless component remained intact and continued to be applied annually through Fiscal Year 2010. As it is, most Hold Harmless districts had built this amount into their budgets and had come to depend upon it for operating expenses. Although, the Hold Harmless component did not account for a significant amount of state revenue it did, to some extent, have a disequalizing effect because it provided additional revenue to a school district after the funding had been equalized through the foundation formula.

The major components to the GSA formula are equalized assessed valuation (EAV) and pupil count (best three months average daily attendance—

ADA). The EAV is utilized to determine the district wealth. The corporate personal property replacement taxes (CPPRT) is also included in the definition of local resources. The more local resources a district has, the less it receives from the state and vice versa. The GSA foundation level is assumed to be the amount necessary to educate a regular student (theoretically an adequacy level). Because some students require additional resources (special education, limited-English fluency, poverty, etc.) there is also categorical funding available. This categorical funding is usually reimbursement based upon a specific service or population and is not equalized against local revenue.

Equity Principles

According to *Webster's Dictionary* the definition of equity is: "1. the quality of being fair or impartial; fairness; justice. 2. something that is fair and just." It is important to understand that equity does not necessarily mean equal, but it does mean fair. Berne and Stiefel (1984) summarized all the principles of student equity under three main categories: horizontal equity, vertical equity, and equal opportunity. *Horizontal equity* is concerned with the equal treatment of equals. This simply means that all students are equal and should be funded at the same level. When thinking about horizontal equity it is not about believing that all students are equal but that there is a basic amount that is necessary for all students. *Vertical equity* is based upon the unequal treatment of unequals. The premise of this concept is that some students need additional resources to be able to achieve their potential. These students are viewed as unequal due to legitimate educational differences, such as non-English speaking, special

education, gifted, poverty, etc. Some examples of illegitimate differences are geography, family income, race, and gender. Equity principles do not allow for a difference in funding per pupil based upon illegitimate differences. Categorical funding addresses the vertical equity where special populations may require additional resources. These additional resources are in addition to the basic level discussed under horizontal equity. *Equal opportunity* is usually defined to mean that all students have the same choices and resources available to them. There have been many definitions attributed to this concept, but according to Berne and Stiefel (1984):

> The principle can be formulated in a negative way: there should not be differences according to characteristics that are considered illegitimate, such as property wealth per pupil, household income, fiscal capacity, or sex. For example, this principle requires that there be no relationship between expenditures, resources, programs, outcomes, and per-pupil wealth or fiscal capacity. (p. 17)

Most general state aid formulas (including the Illinois formula) are devised to address horizontal equity. Because the purpose of this study was to analyze the student equity of the Illinois GSA funding system, horizontal equity and equal opportunity were the main focus of this study. The criterion used in the study to address horizontal equity was permissible variance. This criterion refers to the disparity in expenditures per pupil among school districts. Wealth neutrality was used to measure equal opportunity. This criterion refers to the relationship between expenditures and wealth. Vertical equity was not included in this study because the GSA formula does not address it.

Research Questions

Two major adjustments were made to the GSA formula legislated in Fiscal Year 1999. These are the PTELL adjustment and the GSA Hold Harmless component. Because the GSA formula is an equalization formula, it is important to ascertain the effect of the adjustments to the equity of the funding system. The following research questions were framed to investigate the effect of each adjustment individually and then in combination. The comparisons were made to the equity indices of the system as it existed from Fiscal Year 2000 through Fiscal Year 2011.

1. What were the equity indices in the Illinois GSA funding system from Fiscal Year 2000 through Fiscal Year 2011 as computed by the four standard equity measures: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

2. When eliminating the PTELL adjustment in the Illinois GSA formula and holding the entitlement constant by increasing the foundation level, what are the equity indices in the GSA funding system from Fiscal Year 2000 through Fiscal Year 2011 as computed by the four standard equity measures: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

3. When eliminating the Hold Harmless component in the Illinois GSA formula and holding the entitlement constant by increasing the foundation level, what are the equity indices in the GSA funding system from Fiscal Year 2000 through Fiscal Year 2010 as computed by the four standard equity measures: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

4. When eliminating the PTELL adjustment and Hold Harmless component in the Illinois GSA formula and holding the entitlement constant by

increasing the foundation level, what are the equity indices in the GSA funding system from Fiscal Year 2000 through Fiscal Year 2010 as computed by the four standard equity indices: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

5. What are the similarities and differences in the equity indices between and across the different simulations?

Based on the findings from the five research questions, a discussion proposes what education policy implications may be possible for Illinois school funding.

Definition of Terms

The terms used in this study are defined as the following:

Average Daily Attendance—The term average daily attendance, as used in the Illinois General State Aid Formula, is defined as the average of the highest three months of student attendance for the school year.

Available Local Resources—The term available local resources, as used in this study for calculating the unrestricted revenue, is defined as local property tax revenues (utilizing a formula tax rate) and Corporate Personal Property Replacement Tax.

Collar Counties—The term collar counties is defined to include the counties that surround Cook County. They include DuPage, Kane, Lake, McHenry, and Will.

Conditional Wealth Neutrality—The term conditional wealth neutrality refers to making expenditure less a function of wealth while controlling for operating tax rate.

Corporate Personal Property Replacement Tax (CPPRT)—Replacement taxes are revenues collected by the state of Illinois and paid to local governments to replace money that was lost by local governments when their powers to impose personal property taxes on corporations, partnerships, and other business entities were taken away. CPPRT is considered to be local revenue in the General State Aid calculation.

Equity—Equity is defined as the equality of educational opportunity as delineated by permissible variance, wealth neutrality, and conditional wealth neutrality.

Equalized Assessed Valuation—Equalized assessed valuation is the school district's assessed valuation of property after being adjusted for the county multiplier and is used to determine the district's wealth.

General State Aid Formula—General state aid formula is defined as one of the three formulas (foundation, alternate method, and flat grant) utilized to calculate state aid for school districts.

Local Property Tax Revenue—Local property tax is defined for this study as the district's equalized assessed valuation multiplied by the operating tax rate divided by 100.

McLoone Index—The McLoone Index is defined for this study as the ratio of the actual sum of unrestricted revenue per pupil for all districts below the median to the total unrestricted revenue per pupil if all those districts were at the median.

Operating Tax Rate—The term operating tax rate is defined as the total tax rate less the bond and interest rate.

Permissible Variance—The term permissible variance as used in this study refers to reducing the disparity in expenditure per pupil among the school districts.

Property Tax Extension Limitation Law—A law that caps the extension for all governmental bodies in counties that are subject to the provisions.

Unrestricted Revenue—Unrestricted revenue is defined for this study as the sum of General State Aid, local property tax, and corporate personal property replacement tax.

Wealth Neutrality—The term wealth neutrality refers to making district expenditures less a function of district wealth.

Delimitations

The delimitations of this study are as follows:

1. The two equity principles to be examined are horizontal equity and equal opportunity.

2. Equity measures used in the study are the coefficient of variation, McLoone Index, regression coefficient, and change in R^2.

3. The adjustment in the General State Aid Formula for the Property Tax Extension Law is specific to Illinois.

4. Illinois has three types of school districts: unit, high school, and elementary. Because each district type has a different taxing base and taxing authority the equity indices have to be calculated within district types.

Limitations

1. This study and its findings are specific to Illinois.

2. Property Tax Appeal Board decisions, Certificate of Errors reports, tax increment financing districts, enterprise zones, and the classification system in Cook County are all complications to the property tax system but are not included in this study.

3. There was no attempt to account for consolidation or annexation of school districts during the time period (Fiscal Year 2000–2011).

4. This study did not address adequacy or efficacy of the Illinois General State Aid formula; although, these are important measures by which state formulas can be evaluated.

5. The complexity of the Illinois General State Aid formula prevents the investigation of all the various provisions of the formula as they impact the full range of equity in Illinois public education.

Assumptions

The assumptions for the study include: (a) revenue is a valid measure of expenditure; (b) data are accurate for the years of study; and (c) education policy making is informed by research on effects of laws.

Significance of the Study

The GSA formula is the only state distribution formula in Illinois that equalizes state and local revenue. The revenue used to fund the GSA formula is not sufficient to overcome the large variation of the local property tax among school districts; however, it can be adjusted to make progress toward student

equity. As the call for equity in school funding continues to grow, it is important to know how the various adjustments to the GSA formula impact equity. The equity measurements for the Illinois funding system have continued to deteriorate. No studies have been conducted to determine if adjustments or modifications made to the GSA formula have contributed to the deterioration of equity. This study was conducted to determine the impact that the PTELL adjustment and the Hold Harmless component in the GSA formula had on the equity of the funding system.

Summary

Chapter I has described the current education funding system in Illinois and the equity problem that exists. The study investigates two parts of the General State Aid formula to determine the effect they have on student equity.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

There are three purposes of this chapter: (a) the problem detailed in Chapter I is expanded; (b) the conceptual framework utilized in this study is described; and (c) the studies conducted on the Illinois school funding system by researchers in Illinois and others, using Illinois data, are reviewed. The review of the related literature culminates in the rationale and need for this study.

Summary of the Problem

The funding of public school students in Illinois is not considered to be equitable. In Chapter I, several reports were cited where student equity was a main focus and proposals were made to improve student equity in the Illinois funding system. According to studies conducted by Dr. Hickrod at the Center for the Study of Educational Finance at Illinois State University, equity indices had been worsening, for the most part, in Illinois. Because the main function of the foundation formula is to equalize funds, it is important to investigate what effect changes to the formula have on equity of the system.

There have been two major adjustments to the current General State Aid formula: the Hold Harmless component (adopted with the new formula in Fiscal Year 1999 and eliminated in Fiscal Year 2011) and the Property Tax Extension Limitation Law (PTELL) adjustment (adopted as part of the formula in Fiscal Year

2000). Although the initial associated cost of these adjustments was insignificant, the combined cost of $5.54 billion over the 12-year time period has accounted for a substantial amount of state revenue. To describe this issue and investigate the problem, equity will be used as the conceptual framework.

Conceptual Framework

To describe a problem to be investigated, it is necessary to use a conceptual framework—a lens that provides a focus for the study. Equity was the lens used for this study. In defining a framework for equity for this study, Berne and Stiefel (1984) used four questions to develop their equity framework:

1. Equity is defined how?
2. Equity for whom?
3. Equity of what?
4. Equity is measured how?

Equity Defined

Beginning in the 1970s, school funding equity came to the forefront in the courts and the research arena. Originally, equity was defined to be equal dollars regardless of any student differences. However, it is important to understand that the definition of equity (with regard to school funding) has evolved and is thought of as being fair rather than just equal dollars. In major studies, one way researchers have tried to analyze equity is to examine the extent to which students have equal opportunities. This analysis makes sense because the property tax wealth is not evenly distributed across the state, which means that the local revenue varies among school districts. As a consequence, the

distribution of state funds needs to be modified to equalize the total funding to school districts and offset the variance in local property wealth.

There are also the complexities of what is considered to be fair and whether student differences (e.g., poverty, special education, limited-English fluency, etc.) encourage different levels of funding. To address these complexities, three principles are defined for equity: horizontal equity, vertical equity, and equal opportunity. Horizontal equity is defined as the equal treatment of equals. Horizontal equity is considered in state equalization formulas and is thought of as a base amount that every student should be entitled to. Vertical equity is defined to be the unequal treatment of unequals. The concept of vertical equity includes categorical funding to provide extra resources to students with legitimate differences. These differences could be for special education, limited-English fluency education, at-risk services, transportation, remediation, etc. In the case of vertical equity, there is the expectation of varied levels of resources. Equal opportunity is usually defined to mean that all students have the same choices and resources available to them. The concept of equal opportunity has played a major role in litigation brought against state funding systems. The basis of these lawsuits is that the geography of a student's residence should not impact the opportunities that are available to the student. As mentioned earlier, the property tax revenue is highly disproportionate across the state, so it is important that students in poorer property tax districts still have educational opportunities. The focus of this study was to analyze the horizontal equity and equal opportunity in the Illinois funding system. Vertical equity was

not examined in this study because it is a principle of categorical funding for student differences and not the General State Aid formula.

Equity Target

There are two main targets for school funding equity: taxpayers and students. Taxpayers expect to be treated fairly regardless of the amount of property wealth for the community. They also expect that the same tax effort should yield the same result of revenue. Examining student equity, it can be expected that each student has the same amount of resources available (regardless of where the resources come from). State legislators are concerned with both of these groups and must balance the issues and compromise when passing legislation that affects both of them. However, the state education agency is concerned with the equity of students, because the education of Illinois students is its primary interest. This study focused on the student equity of the state funding system.

Equity of What Resources

Local school districts have access to state, local, and federal resources to provide services for their students. The federal resources are categorical funding that can only be used for specific purposes or populations. State funding consists of categorical funding and general state aid. General state aid provides a base amount for each student. In Illinois, the General State Aid formula has a foundation level specified in statute that is based on a combination of state and local funds. Local resources are mostly general funds (can be used for any valid school expense) but they can also consist of revenue that is considered

categorical by nature (such as special education, transportation, etc.).

Because this study utilized the horizontal and equal opportunity equity principles, the categorical funding was not considered in the resources for school districts. As mentioned earlier, categorical funding is considered when analyzing the vertical equity principle.

Equity Criteria

To determine whether a funding system is equitable, there must be some criteria with which to define equity. In 1984, Berne and Stiefel were instrumental in defining equity concepts with regard to school finance and developing a framework for the measurement of those equity concepts. With regard to state systems in the 1970s through the mid 1980s, Berne and Stiefel (1984) concluded:

> Equity is continuously assessed in many states, particularly when the state's policymakers contemplate changes in the state's school-financing system. For example, during the last decade, over half of the fifty states have "reformed" their state finance systems by changing the way in which state aid is distributed. Equity goals usually comprise a significant component of the rationale for these changes. (p. 217)

Even though there is a framework in which to measure equity, the first decade of the 21st century is almost complete, and there is still a struggle with attaining equity in school funding.

The equity criteria used in the study were permissible variance and wealth neutrality. Permissible variance addressed horizontal equity—the equal treatment of equals. Wealth neutrality addressed equal opportunity—ultimate goal is no unfavorable relationships (such as wealth of a school district and resources per pupil).

Permissible variance. The goal of this equity criterion is to have little or no disparity in expenditure per pupil. Two indices were used to measure permissible variance: the McLoone Index and the coefficient of variation. The McLoone Index is based upon the amount of dollars needed to bring the bottom half of the population up to the median level of expenditures. The index was operationally defined as the ratio of the actual revenues of the school districts below the median to the sum of the revenues needed to bring those school districts up to the median level by school district type. The closer the index is to 1, the closer the system is to perfect equity. The formula for the McLoone Index is:

$$(\sum_{i=1}^{j} P_i X_i) \,/\, (M_p \sum_{i=1}^{j} P_i)$$

Where P_i is the number of pupils in district i; X_i is the average revenue per pupil in district i and M_p is the median revenue per pupil by school district type. Districts i through j are below M_p.

The coefficient of variation was operationally defined as the standard deviation of the revenue per pupil divided by the mean and multiplied by 100. The coefficient of variation was also calculated by school district type. The closer the coefficient is to zero the less variation there is in the revenue variable and the greater the equity. The formula for the coefficient of variation is the standard deviation of the revenue per pupils by school district type divided by the mean revenue per pupil by school district type multiplied by 100:

$$SD \,/\, \bar{X}_p * 100$$

Wealth neutrality. The goal of this equity criterion is that expenditure is not a function of district wealth. In this study, it was operationalized as a simple regression. The closer the regression coefficient is to zero, the closer the state is to meeting this equity goal of being wealth neutral. Two regression models were defined to measure this criterion. Log 10 transformations were performed on all of the variables in the regression models to help mitigate the effects of the outliers on the results.

The first model was a simple regression, where revenue per pupil was the dependent variable and the district wealth was the independent variable. District wealth was defined as the equalized assessed valuation per pupil. The regression formula was defined as:

$$Y = a + bX$$

where Y was the revenue per pupil, X was the district wealth (EAV per pupil), b was the regression coefficient.

The second model was a multiple regression where revenue per pupil was the dependent variable and district wealth and operating tax rate (OTR) were the independent variables. According to Schmink, Halinski, Hickrod and Hubbard (1979) and Hinrichs (1982), this definition has been referred to as conditional wealth neutrality because the goal is to determine the effects of district wealth while controlling for tax rate (effort). This means that the effects of the OTR were accounted for so it could be determined how much of the remaining variation in expenditure can be attributed to district wealth. There were two steps to the multiple regression. The first step was to have revenue as the dependent

variable and OTR as the independent variable. The R^2 indicated the amount of variability in revenue that could be associated with OTR. The second step had both OTR and wealth (EAV per pupil) as independent variables and the R^2 indicated the amount of variability in revenue that was associated with both OTR and wealth. Step one R^2 subtracted from step two R^2 yielded the change in R^2, which was the measure of the relationship between revenue and wealth (Schmink, Halinski, Hickrod, & Hubbard, 1979). Again, the smaller the value of the change in R^2, the closer the state is to being conditionally wealth neutral (a weaker relationship between revenue and wealth). The formula for the multiple regression model was:

$$Y = a + b_1X_1 + b_2X_2$$

where Y was revenue per pupil, X_1 was EAV per pupil, and X_2 was OTR.

There were three reasons for choosing the Mcloone Index, coefficient of variation, regression coefficient, and change in R^2 to measure the equity criteria. First, the Illinois funding system consisting of local property taxes, corporate personal property replacement tax, General State Aid, and General State Aid Hold Harmless is based upon an equalization function that strives for horizontal equity and equal opportunity. The McLoone Index and coefficient of variation are both cited in Berne and Stiefel's (1984) framework as appropriate measures for gauging horizontal equity. Second, the literature supported the use of these measures as they had been used in many equity studies within the field. Finally, the Illinois State Board of Education routinely used these measures (except for the change in R^2) in analyzing the funding system. Thus, they are understood to

be valid and reliable measures of horizontal equity and equal opportunity and allow for comparison to previous studies.

Summary

The importance of investigating these formula adjustments is twofold. The first reason is that there has been criticism for many years that equity in Illinois school funding needs to be improved. Studies have been completed, commissions have been created, and reports have been written that analyzed school funding equity and provided recommendations to improve student equity in Illinois. Yet, when adjustments have been made to the equalization formula in the funding system, there have not been any follow-up analyses to determine the impact of these adjustments on the equity goals of the state.

Second, the foundation formula used in Illinois is based upon equalizing local and state revenue, but two adjustments work against the equalization factor. The PTELL adjustment can decrease the local resources that are utilized in the GSA formula (for school districts subject to local tax limitations) that could result in an increase to the amount of GSA. This means that some of the GSA appropriation would be used to offset a local loss for some school districts rather than increasing the foundation level. The Hold Harmless component provides additional state revenue to some school districts after the calculation of the equalization formula. The GSA formula is the only state distribution formula that equalizes state and local revenue. It is important to know how various adjustments made to the GSA formula impact the overall student equity of the system. This study is important because it analyzes the effect, on selected

equity measures, of two main adjustments to the GSA formula that have utilized a large portion of the GSA appropriation over a 12-year time period.

Previous Studies

The studies reviewed were based upon equity analyses of Illinois funding systems. Four categories described the purposes of the studies: (a) historical studies of Illinois funding, (b) equity studies of a specific Illinois funding system, (c) studies analyzing a new equity measure/funding system in Illinois, and (d) comparison studies of Illinois funding system to other states. In some instances studies may overlap categories. This section contains a review of the studies organized by the categories and support for the importance of this study.

Historical Studies of Illinois Funding

James Ward (1987) conducted a review of the school funding structures in Illinois from 1927 to 1987 and discussed political aspects of school funding. In Illinois, a foundation formula approach has been used to fund school districts since 1927, with the exception of 1980 through 1998. In 1972-1973, the governor, state superintendent, and legislators each appointed a committee to study school funding reform. In 1973 a compromise was reached by combining elements from each group. A senior legislator was quoted by Hickrod, Chaudhari, and Hubbard (1985) as saying, “Well, Illinois has done it again. We always pass a Christmas tree with a gift hung on it for everybody. Then we figure out the wiring later“ (p. 2).

In 1973, legislators passed the reform to adopt the Resource Equalizer formula (a foundation formula and flat grant were optional formulas included in

the law), which is a guaranteed tax base with a property tax rollback component. The Resource Equalizer formula guaranteed a tax base level for each school district type (levels were specified in statute) that was used in the calculation of general state aid. However, before the Resource Equalizer formula was fully implemented, the legislators repealed parts of the formula and effectively created a guaranteed tax base (GTB) formula.

Studies by Hickrod, Chaudhari, and Hubbard (1985) and Hinrichs (1982) detailed the revisions to the Resource Equalizer formula during 1976 to 1980. There were two main provisions to the 1973 reform: a property tax rollback and a reward for effort component. The problem was that the two main provisions were not compatible. It is difficult to have a formula that provides required property tax relief for high tax school districts while also providing additional state funds for school districts taxing at higher rates (reward for effort). In 1976, the property tax rollback was repealed and a one-year hold harmless was added to the funding system. The foundation formula (Strayer-Haig) was modified in 1978 allowing wealthier school districts to access increased state funds and the hold harmless was continued at 90% of the prior year claim. In 1979, the foundation formula was increased again and the Resource Equalizer formula was fully operational (there had been a 3-year phase-in). The final blow to the 1973 reform came in 1980 when the reward for effort component was eliminated by making the tax rates in the Resource Equalizer formula constant. Essentially this modified the guaranteed tax base formula to be algebraically the same as a foundation formula. With the elimination of the optional formulas (foundation, alternate

method, and flat grant), the modified guaranteed tax base formula became the main formula. However, to ensure that all school districts would receive some general state aid a new alternate method formula was adopted for the property wealthy school districts. The formula in place in 1980 was nothing like the formula adopted under the 1973 reform. According to Ward (1987),

> The 1973 reform did seem to increase equity in school spending throughout the state and, as such, represented a positive move toward reform. Changes in the formula later in the 1970s weakened the equalization elements and by 1980 the state of Illinois had reverted to a "politics as usual" approach to funding public schools. (p. 109)

In 1986, there was an increased effort for school funding reform and creating a new general state aid funding formula. The goal was to have a funding reform proposal ready for passage during the 1987 legislative session. During this 2-year period, many hearings were conducted, councils created, and groups merged to develop new funding strategies for the state. The Illinois Problems Commission had been in existence since 1949 but in 1985 the General Assembly eliminated it and all permanent commissions. A new council was created to replace the Illinois Problems Commission. It was the Citizen's Council on School Problems. The members were legislators but, unlike the Illinois Problems Commission, it did not have an appropriation to fund staff. Dr. Alan Hickrod and Dr. James Ward provided assistance to the council. Several public hearings were conducted to obtain feedback on how the funding formula should be revised. It appeared that much of the testimony centered on special interest funding rather than the revision of the general state aid formula. The intent of council members was to make a report to then Governor James Thompson on

how the state funding formula should be revised.

Also during this time, other meetings were being conducted on state school finance issues. In June of 1986, Governor Thompson, along with various education groups, conducted a seminar to discuss school funding. State and national experts were invited to attend. In the fall of 1986, the Illinois State Board of Education Advisory Committee on Financing Public Education created a set of principles that the state could use when formulating its strategy for funding public education. The School Finance Advisory Panel was created as another mechanism to promote school funding reform. The members consisted of education and non-education interest groups. They held two meetings but did not seem to make much progress. Two education groups, The Illinois Association of School Boards and Illinois Association of School Administrators, combined forces to create 14 guiding principles that the state should use in funding education. These principles centered on adequacy and equity of education funding. Their 10th principle states:

> Equity should be approached through increasing the state's contribution rather than reducing local funds for education or reallocating the state's contribution. (Ward, 1987, p. 116)

Even with all the attention given to funding reform and the effort that was expended by the various groups during this 2-year period, there was no funding reform implemented. It was concluded that this was, in part, because of the lack of state revenue to implement the reform and lack of consensus on what the reform should be. Governor Thompson's tax increase failed to pass and the current funding formula was left intact. It seems that a lingering question from

Dr. Ward was: how long can a policy issue be kept viable and in the mainstream of discussion? Would there still be discussions of school funding reform or did it end here?

During this period of increased activity of trying to bring about school funding reform, the legislators passed legislation to sunset the current funding formula in 1987. Because no consensus was reached by the various groups, the sunset legislation was repealed and the modified guaranteed tax base formula remained in place. In 1990 the discussion of school funding reform ignited again, and legislative action created a task force to study school finance. In 1993 the final report (Report of the Illinois Task Force on School Finance) contained several recommendations such as adopting a foundation formula to distribute general state aid, utilizing a regional cost adjustment, devising a methodology to determine an adequate level of funding, defining the equity goal as “leveling up” by decreasing the variation in expenditure per student, modifying the local tax structure, providing property tax relief, and including a permanent hold harmless (for general state aid).

No action had been taken on the recommendations of the legislative task force, so in 1995 the Governor created another group (the Governor’s Commission on Education Funding) to study school finance reform. In 1996 a report was released that detailed the recommendations from the commission. These recommendations included a foundation formula to distribute general state aid, a methodology to determine an adequate level of funding, a $4,225 foundation level (based upon a pilot study), a statute to specify the methodology

(not a foundation level), property tax relief, a reduction in revenue per pupil disparity by “leveling up”, a separate poverty grant, creation of a regional cost adjustment, and accountability of school funding and performance.

Finally in 1997, legislation was passed that included some recommendations from the previous reports. Hinrichs (1998) compared the new funding formula to the existing modified guaranteed tax base formula. Beginning in 1999 general school funding would be distributed through a foundation formula with a statutory level of $4,225. The grade level and poverty weightings of the existing formula were eliminated and a separate poverty grant was created. Two additional formulas (alternate method and flat grant) were adopted to ensure all school districts would receive general state aid. Also included was a hold harmless clause that would keep school districts from losing general state aid from the previous year. Another part of the statute created the Education Funding Advisory Board (EFAB). The responsibility of EFAB is to make recommendations regarding the foundation level and student poverty grant every 2 years. The foundation level recommendation is to be based upon a methodology that was prescribed in statute. Although the same basic formula is in place, there have been revisions since 1999.

Equity Studies of a Specific Illinois Funding System

Hickrod and Hubbard (1977), Hickrod, Chaudhari, and Lundeen (1980), and Hickrod, Chaudhari, and Hubbard (1985) examined funding reform in 1973 to determine if there was progress toward equity. In 1973, a new general state aid formula referred to as the “resource equalizer” replaced the former foundation

formula as the main funding formula. This new formula was an alternative way (to the foundation formula) to equalize local property tax revenue with general state aid revenue across districts in the state. It not only included a reward for effort component, as part of the guaranteed tax base, but included a property tax rollback component. Hickrod and Hubbard (1977) reviewed annual evaluations from a 3-year time period to determine progress toward the equity goals. Hickrod, Chaudhari, and Lundeen (1980) compared two points in time to determine progress toward the equity goals. Two equity goals that were common to both studies were wealth neutrality (also known as fiscal neutrality or equal opportunity) and permissible variance in expenditure per pupil. According to Berne and Stiefel (1984), "the wealth neutrality concept states that education should not be a function of local wealth" (p. 17). The first state goal was to minimize the relationship between district expenditures and local district wealth to an acceptable level. The second state equity goal was to decrease the variation in expenditure per pupil to an acceptable level.

Findings from both studies indicated that the state had made progress toward the stated equity goals during the time period reviewed. However, they both indicated that the elementary school districts did not progress as well as high school or unit districts. There was consensus that a major problem with Illinois school funding systems was that there are three distinct types of districts: elementary, high school, and unit. Multiple district types cause problems for the state in the distribution of the funding and also in the analysis of the data. It also makes it very complex to try to compare Illinois data to other states, because the

majority of them are organized as unit school districts.

Although Hickrod and Hubbard (1977) did not compare their analysis of Illinois to other states, they noted that, because of the Illinois specific funding formula and unique district type organization, it is very difficult to do any comparisons. However Hickrod, Chaudhari and Lundeen (1980) did make comparisons to Indiana and Iowa in their study. They specified many differences such as the definition of expenditures, pupil count, and time span for data, but indicated they could make some "rough comparisons" (p. 17). The resulting comparison consisted of whether Illinois made greater strides toward the equity goals than the other two states.

Three objectives of the study by Hickrod, Chaudhari, and Hubbard (1985) were to detail the revisions to the 1973 reform, specify the evaluation, and analyze equity over a 14-year period. Equity was defined as equal educational opportunity and was measured using the McLoone Index, coefficient of variation, wealth-weighted Gini Index, and linear least squares regression. A major difference of this study is the time period of the analysis. This study encompassed 14 years, while the other studies only utilized 1 to 3 years of data. For this section, the interest is on the equity analysis of the study. Although the results varied by school district type, there were some interesting findings. The coefficient of variation showed improved equity for 4 years for elementary and unit school districts and 5 years for high school districts and then began to become less equitable. Elementary school districts had lost all of their equity gain by the end of the 14-year period. However, high school and unit school districts retained

some of their gains. The results were similar for the McLoone Index with two differences. First, the McLoone Indices seemed to be more erratic across school district types than the coefficient of variation. Second, all school district types ended up the time period with gains in equity. It appears that at least some of the equity gained under the new formula was lost during the time of the revisions to the formula from 1976 to 1980. A modified Gini Index utilizing a weighting for district wealth and a regression approach (weighted and unweighted) was used to measure wealth neutrality in the funding system. There were very similar results for the wealth neutrality measures. The equity improved for all school district types followed by a decline in equity. It seemed that elementary school districts had lost all of their gain by the end of the 14-year period for both the Gini and regression approaches, but unit and high school districts retained some of their gains. For the most part, unit school districts had the most equity in the funding system, elementary school districts were second, and high school districts had the least equity. Although next steps were not really specified, there were some interesting discussion points. First is that improved equity requires continued state funding. When the state funding decreases, it seems that the equity in the system declines. Second is that to pass “reform” legislation components have to be added to the formula. These additions cost money but do not necessarily improve equity. Finally, when thinking about equity goals “Equity attainment depends not only upon the actions of a state legislature, but also upon what is simultaneously happening at the local base” (Hickrod et al., 1985, p. 5).

The purpose of the study conducted by Verstegen and Driscoll (2008) was to measure equity in the Illinois funding system. They analyzed data collected for the single year 2005. The formula being analyzed had been in existence since Fiscal Year 1999. Therefore, the impetus for this analysis was not to evaluate funding reform (as in the first articles reviewed) but rather to conduct an equity analysis at a point in time. Verstegen and Driscoll (2008) included all state revenue (except transportation reimbursement) along with the local property tax revenue in their analysis. They also assumed student weightings for special education, limited-English fluency education, and poverty. The weightings used in their analyses were cited from the literature. It was unclear from the report how they determined the count of special education or non-English fluent students by school district and whether they assigned the same weighting across all special education students. The equity measures were calculated within the three district types but also across all district types.

The main findings were that the Illinois funding system had wide disparities within each district type and was not wealth neutral. The same findings applied to the calculations across all district types. Verstegen and Driscoll (2008) concluded that the State of Illinois needed to provide a majority of the funding to school districts and reduce the reliance on local property tax.

Mullin and Brown (2009) attempted to replicate the Verstegen and Driscoll (2008) study. Although the same equity measures were analyzed, Mullin and Brown (2009) concluded that the equity indices were worse than the original study indicated. They indicated that the difference in findings was partly due to

Verstegen and Driscoll (2008) not fully describing the source of the variables used in their study. The variables in question were counts of special education students, counts of poverty students, district size, and equalized assessed valuations. It seems that a difference in methodology between the two studies also added to the inconsistent findings. Mullin and Brown (2009) chose not to include categorical funding as part of the state revenue in their analysis. Also, they decided to use the school district as the unit of analysis rather than the student.

Recommendations made by Mullin and Brown (2009) included addressing special interest populations, analyzing both adjusted and unadjusted data, and preparing a comprehensive state report. Most of these recommendations stemmed from a difference in opinion as to whether categorical funding and special population adjustments should be included in the equity measures or not.

Verstegen and Driscoll (2009) responded to the criticisms included in the replication study by Mullin and Brown (2009). They reviewed their original study and compared it to the Mullin and Brown (2009) replication study. They indicated that the study (Mullin & Brown, 2009) was flawed due to the following reasons:

1. The school district was the unit of analysis.
2. It used only the General State Aid formula revenue and none of the state categorical revenue.
3. It did not include an analysis of the vertical equity principle.
4. The poverty grant revenue was included but did not weight or adjust for the count of poverty students.
5. The analysis used an outdated equalized assessed valuation.

Verstegen and Driscoll (2009) reiterated their original findings that the Illinois funding system is inequitable and is not wealth neutral (does not provide equal opportunities for all students).

Hickrod and Hubbard (1977) and Hickrod, Chaudhari and Lundeen (1980) compared indices between two points in time to evaluate a new funding formula. However, Verstegen and Driscoll (2008, 2009) and Mullin and Brown (2008) only analyzed one year of data, so there was no comparison. Hickrod, Chaudhari, and Hubbard (1985) expanded the Hickrod and Hubbard study (1977) to analyze 14 years of data to investigate patterns. Another difference in the studies pertained to categorical funding. Verstegen and Driscoll (2008, 2009) proposed the inclusion of all state funding, including categorical funding, in an equity study. Their belief is that the equity results would be skewed if the categorical funding was eliminated from the analysis. However, Hickrod and Hubbard (1977) had a different viewpoint on whether to include categorical funding in the equity analysis:

> In essence then, we have assumed that state general equity goals must be achieved before "targeted" money is laid on, since "targeted" money is intended for special needs after general equity has been achieved. We have therefore taken the same policy position relative to state categoricals that the federal officials generally take relative to federal categoricals. Equity, or in the federal terms "parity," must be achieved first with general state aid and local dollars before categorical dollars are allowed to enter the calculations. (p. 23)

Studies Analyzing a New Equity Measure/Funding System in Illinois

Hinrichs (1982), Dahncke (1990), and Smith (1994) studied school funding equity in Illinois by creating hypothetical situations. In the case of Hinrichs

(1982), pseudo-unit districts were created in the state by combining the dual elementary and high school districts. Once the pseudo-unit districts were created, the equity criteria (wealth neutrality, conditional wealth neutrality, and permissible variance) were measured using the Gini Index, regression, McLoone Index, and coefficient of variation. The state made progress toward equity in comparing 1974 to 1977 but reversed when comparing 1977 to 1982. A future step suggested in the study was to expand the study to include additional years (1976, 1978, and 1980) to see possible patterns in the measures of equity. According to Hinrichs (1982): “If equity in school finance is a desirable goal in the state of Illinois for the school population, the General Assembly should consider any district organization which would positively affect the degree of equity” (p. 128). At the time of this study, not only did the creation of pseudo-unit districts improve equity but also decreased the number of school districts by 40% (1,000 districts down to 600).

Dahncke (1990) simulated a general state aid formula that was proposed by the Illinois State Board of Education in 1985. The purpose of the study was to compare the equity indices of the simulated formula to the equity measures of the actual formula. The first step was to simulate the three-tier formula. All school districts would receive funding through a flat grant in the first tier. School districts that had local revenues per pupil less than the foundation level would receive funding through the foundation formula in tier two. Finally, the third tier was a reward for effort formula that would provide additional funds for school districts that have tax rate higher than the permissive rate. The second step was

to calculate the equity measures for the simulated formula and actual formula. Dahncke (1990) used fiscal year 1989 funding data for 34 selected school districts. The McLoone Index was utilized to measure horizontal equity and the Gini Index was utilized to measure equal opportunity (wealth neutrality). The findings indicated that the simulated formula was not more equitable than the actual formula. High school districts had the higher (more equitable) McLoone Index, followed by unit school districts. Unit school districts had the lower (more equitable) Gini Index, followed by high school districts. Elementary school districts fared worse for both of the equity measures. Weaknesses of the study included not using a random sample for selecting the school districts and analyzing a single year of data. Next steps were to replicate the study to include all school districts in the state, expand the number of years analyzed, utilize additional equity measures, include categorical funding, and analyze adequacy of the funding formulas.

Smith (1994) was interested in redistributing the commercial and industrial equalized assessed valuation (EAV) across the state. The EAV was subtracted from the individual school districts and redistributed based upon average daily attendance. This study only measured the horizontal equity of the EAV redistribution using the Federal Range Ratio and coefficient of variation. Smith (1994) did not include an equity analysis of the state funding formula and was not interested in the equity goal of equal opportunity (wealth neutrality). Major weaknesses of the study were that the equity measures were calculated statewide rather than by school district type and district size was not taken into

consideration. Also, Smith (1994) only investigated EAV data from 1988, so it was not possible to make conclusions about trends.

Lows (1985) investigated the three school district types in Illinois and devised a procedure to analyze across them rather than having to measure equity within each district type. Most previous equity studies conducted in Illinois had included equity measured within each district type. This was a problem because it was difficult to report how the state as a whole was progressing toward equity goals. Lows used the Gini coefficient and analyzed data at two points in time (1981 and 1984). The funding formula for those two points in time was similar to the current formula, in that, there were three options. Option 1 was basically a foundation level formula, option 2 was an alternate formula, and option 3 was a flat grant. The amount of local revenue for a school district determined which option applied.

Lows (1985) used complex formulas to calculate the Gini coefficients. Five levels of inequality were defined for the study. The first level calculated the amount of inequality associated with option 1 of the funding formula. The second level added into the equation option 2 of the funding formula and depicted the amount of inequality associated with option 2. Option 3 of the funding formula was added into the third level. The fourth level included the inequality by adding in the corporate personal property replacement tax revenue. Finally, the fifth level added in the local taxing leeway (either having tax rates above or below the statutory rate used in the formula) of school districts. Next, seven combinations of school district type were created. These consisted of elementary; secondary;

unit; elementary and secondary; elementary and unit; secondary and unit; and elementary, secondary and unit. The final computations calculated the inequality of each level by each of the categories of district type. Each level was added to the equation one at a time to parcel out the amount of inequity it added to the total amount of inequity.

The findings indicated three major concerns. First, elementary districts in Illinois had the most inequity under option 1 (equalization) of the formula. Second, when considering the local leeway in local taxation, secondary districts fared less well. Third, all district types were less equitable in 1984 than they were in 1981. In summary, the author suggests that legislators need to either improve equity across all district types or mandate unit school districts. According to Lows (1985), “Simply put, the quality of a child’s education should not be a function of the type of school district in which the child resides” (p. 55).

It was unclear in the description of the study how revenues were used when combining school district types. For example, when combining elementary and unit districts for analysis, were all the revenues used in the unit district even though some were for high school students? Once again only two points in time were analyzed, which did not allow for trend data. It was also unclear why those specific years were chosen for the study.

The studies in this category clearly indicated problems with funding equity in Illinois and that some part of that inequity was due to differences in the organization of school districts. Hinrichs (1982) and Lows (1985) both investigated the effect of district type on equity. Hinrichs (1982) created pseudo-

unit districts for analysis and Lows (1985) conducted a computational analysis to show the inequities. Smith (1995) seemed to ignore the school district organization and calculated equity indices across the state. Dahncke (1990) analyzed across school district types, but was not interested in specifying how equitable the funding system was but rather compared the equity indices of the funding system to a simulated funding system. Also, because Dahncke (1990) only analyzed a single year, there was no comparison over time.

Comparison Studies of Illinois Funding to Other States

It was discussed earlier that comparison of equity studies across states is extremely difficult for all sorts of reasons. Yet, it was the purpose of the study by Hirth (1994) to analyze horizontal equity trends in Indiana and then make comparisons to Illinois and Michigan. The majority of the study consisted of background information on the school funding structure in Indiana, and the equity study conducted utilizing Indiana data from 1982 through 1992. There were short summaries of Illinois and Michigan, and finally a summary of findings.

In summarizing data for Illinois, Hirth (1994) used studies produced by the Center for the Study of Educational Finance at Illinois State University from 1973 to 1988. Once again. the school district organization in Illinois complicated the equity discussion. The studies reviewed indicated that there had been progress in increased funding equity until the last couple of years when equity worsened. “The researchers conclude that Illinois is not equitably funded with regard to K-12 education and that the situation relative to equity is growing progressively worse” (p. 185). The worsening of equity was attributed to changes in the formula and a

lack of state revenues to dedicate to the funding formula. Also, this study included a short summary of the Illinois funding lawsuit in November 1990 that was dismissed on grounds that it was the responsibility of the legislature to finance education in the state. Finally, there was a comment regarding the School Finance Task Force that made recommendations to the General Assembly in 1993 regarding such things as adequacy, regional cost adjustment equity, property tax structure, and relief. It is interesting that these same categories of recommendations were also made by the Illinois Education Funding Advisory Board (EFAB) just a few years later in 2002. Illinois' school funding problems continue to exist.

Many cautions were cited in the study regarding comparisons across states. Some of these were differences in the funding formulas, categories of revenues and expenditures, and different time series of analysis. With all of these cautions, it was unclear why the author chose to make comparisons to Illinois and Michigan.

Hickrod, Chaudhari, and Lundeen (1980) compared progress in equity goals for Illinois, Indiana, and Iowa. The hypothesis for the study was:

> The reforms of the 1970's succeeded most in reducing the disparities in property tax burdens between school districts, succeeded less well in increasing wealth or fiscal neutrality, and succeeded least well in reducing disparities between districts in expenditures per pupil. (p. 3)

The equity analysis consisted of two points in time beginning with 1973 for all states but a varying ending year (1977 for Indiana, 1978 for Iowa, and 1979 for Illinois. A major problem in comparing across these states is that Illinois contains

three types of school districts (unit, elementary and high school), but Indiana and Iowa are organized as unit school districts. Equity goals analyzed included disparity in expenditure per pupil and unconditional wealth neutrality. All of the states had the greatest amount of improvement with the unconditional wealth neutrality. Indiana had the least amount of improvement, and Illinois elementary school districts showed little progress on any of the equity measures. In Illinois, unit school districts had the most progress toward wealth neutrality but actually lost ground on disparity in district expenditures. The erratic results between the equity goals and across states led to a summation that "Fiscal policies designed to reduce expenditure disparity may or may not contribute to wealth neutrality" (p. 29).

In 1973, Illinois, Kansas, and Michigan changed their school funding formulas from foundation programs to power equalizing programs. Yang (1975) analyzed the effect on equity of the funding reforms in these three states. The study utilized 3 years of data, which included the year before the funding reform and the first 2 years of the reform. The equity measures used were the coefficient of variation, McLoone Index, Gini Index, and simple regression coefficient. The analysis was complicated because Illinois has three types of school districts (elementary, high school, and unit), but Michigan and Kansas are organized as unit school districts. Also, Kansas school districts were analyzed by three size categories (less than 400 students, 400 to 1,299 students, and greater than 1,299 students), because the funding reform contained adjustments for school district size. All groups had progress toward equity as measured by

the coefficient of variation. The only note was that Illinois elementary school districts and Kansas small school districts had higher equity gains in the first year of the reform compared to the second year. The results of the McLoone Index were not as positive. Illinois elementary school districts, Michigan school districts, and Kansas small school districts were less equitable both years of the funding reform. The other groups analyzed (Illinois unit and high school districts and Kansas medium and large school districts) were more equitable. All of the groups had increased equity as measured by the Gini Index and the simple regression coefficient. Kansas small school districts had a smaller equity increase in the second year of the funding reform, while all other groups had more equity in the second year compared to the first year.

Need For and Significance of the Present Study

Many equity studies have been conducted based on data from the Illinois funding system. Inequity in school funding is the major theme of these studies. Some of these studies investigated certain points in time and specific funding formulas in place, while other studies simulated changes to the funding structure in the state. None of these studies examined the impact that specific adjustments made to the General State Aid formula had on equity. Also, most of the studies reviewed examined either two points in time or a single point in time for analysis. An exception was the Hickrod, Chaudhari, and Hubbard study (1985) that analyzed the Resource Equalizer formula that was adopted in 1973 for 14 years (1973 to 1986). The Property Tax Extension Limitation Law and Hold Harmless adjustments were analyzed for 12 years (2000 through 2011) to

determine the trend of equity (or inequity) that had occurred. This study filled two important gaps in the literature. The first gap was that there had not been any equity studies on school funding in Illinois that analyze several years of data for the foundation formula that was adopted in 1999. This is critical information to determine if a funding system meets the equity goals of the state. The second gap was that there had not been any equity studies on school funding in Illinois regarding adjustments made to the General State Aid formula. Two critical legislative provisions have been added to the General State Aid formula that have required funding of $5.54 billion over a 12-year period, but no study had been conducted to analyze the effect they have had on the equity goals of the state. This study filled both of these gaps in the research, informed policymakers, and provided a basis for future research on Illinois school funding.

CHAPTER III

METHODS AND PROCEDURES

One reason for utilizing an equalization formula is to eliminate or at least decrease the disparity in per pupil funding; therefore, it is important to understand how various adjustments to the GSA formula affect equity in the funding system. The purpose of this study was to investigate the impact that the Property Tax Extension Limitation Law (PTELL) adjustment and the GSA Hold Harmless component had on equity in the Illinois funding system. Because the State of Illinois has three types of school districts with different taxing authority and tax bases, the analyses were completed within district type and not the state as a whole. This chapter will specify the methodology and statistical procedures to address the five major research questions.

Research Questions and Statistical Methods

Research Question 1

> What were the equity indices in the Illinois GSA funding system from Fiscal Year 2000 through Fiscal Year 2011 as computed by the four standard equity measures: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

This research question was answered by computing the specified equity indices by district type for Fiscal Years 2000 through 2011. The simple regression model used the unrestricted revenue per pupil as the dependent

variable and the equalized assessed valuation per pupil as the independent variable. The multiple regression model added the operating tax rate as another independent variable. The results of the equity indices were used as a baseline for comparison of the measurements calculated in the following three research questions.

Research Question 2

> When eliminating the PTELL adjustment in the Illinois GSA formula and holding the entitlement constant by increasing the foundation level, what are the equity indices in the GSA funding system from Fiscal Year 2000 through Fiscal Year 2011 as computed by the four standard equity measures: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

This research question was answered by calculating the associated cost of the PTELL adjustment, eliminating the adjustment in the GSA formula, increasing the foundation level to utilize the associated cost of the PTELL adjustment and recalculating the GSA formula. These steps were completed for Fiscal Years 2000 through 2011. The specified equity indices were calculated. Again the simple regression model used the unrestricted revenue per pupil as the dependent variable and the equalized assessed valuation per pupil as the independent variable. The multiple regression model added the operating tax rate as another independent variable.

Research Question 3

> When eliminating the Hold Harmless component in the Illinois GSA formula and holding the entitlement constant by increasing the foundation level, what are the equity indices in the GSA funding system from Fiscal Year 2000 through Fiscal Year 2010 as computed by the four standard

> equity measures: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

This research question was answered by calculating the associated cost of the Hold Harmless component, eliminating it in the GSA formula, increasing the foundation level to utilize the associated cost savings and recalculating the GSA formula by school district. These steps were completed for Fiscal Years 2000 through 2010 (the Hold Harmless component was eliminated in Fiscal Year 2011). The specified equity indices were calculated. Again the simple regression model used the unrestricted revenue per pupil as the dependent variable and the equalized assessed valuation per pupil as the independent variable. The multiple regression model added the operating tax rate as another independent variable.

Research Question 4

> When eliminating the PTELL adjustment and Hold Harmless component in the Illinois GSA formula and holding the entitlement constant by increasing the foundation level, what are the equity indices in the GSA funding system from Fiscal Year 2000 through Fiscal Year 2010 as computed by the four standard equity indices: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

This research question was answered by eliminating the PTELL adjustment and Hold Harmless component in the GSA formula; increasing the foundation level to utilize the associated cost savings of these two formula components; and recalculating the GSA formula. These steps were completed for Fiscal Years 2000 through 2010. The specified equity indices were

calculated. Again, the simple regression model used the unrestricted revenue per pupil as the dependent variable and the equalized assessed valuation per pupil as the independent variable. The multiple regression model added the operating tax rate as another independent variable.

Research Question 5

> What are the similarities and differences in the equity indices between and across the different simulations?

This research question was answered by analyzing the results across the first four research questions to determine the similarities and differences by school district type and equity measure.

Population and Sources of Data

The population used in this study consisted of Illinois public school districts from Fiscal Years 2000 (n=896) through 2011 (n=868). The equity measures were calculated for the school districts in existence each year. No attempt was made to account for consolidation or annexation of school districts over the time period.

The Illinois Department of Revenue (IDoR) is responsible for the collection and verification of the corporate personal property replacement taxes, equalized assessed valuations (EAV) and tax rates for the school districts in the state. The IDoR transfers the certified data to the Illinois State Board of Education for use in the General State Aid formula.

Average daily attendance (ADA), corporate personal property replacement taxes (CPPRT), equalized assessed valuations, General State Aid entitlements,

General State Aid Hold Harmless payments, limiting rates, poverty counts and tax rates were obtained from the Illinois State Board of Education. School district demographic data needed were district ID, district name, district type, county and PTELL status. The data files obtained from the Illinois State Board of Education are listed in Table 1.

Table 1

Data Files Obtained from the Illinois State Board of Education

File Name	Years	Variables
AVTRyy.XLS	1996 through 2009	District ID, EAV and Operating Tax Rate
DISTRICT_SUMyy.XLS	2000 through 2011	District ID, district name, county and district type
GSAVARyy.XLS	2000 through 2011	District ID, ADA, CPPRT, EAV adjustments, GSA Entitlements, Hold Harmless payments, poverty counts
PTELLyy.XLS	1997 through 2009	District ID and limiting rate

Summary

This study involved five major steps to address the research questions. In the first step, the GSA formula was calculated (as it was calculated and distributed to school districts), and then the equity indices were determined for each of the Fiscal Years from 2000 through 2011. This first step provided the baseline data for comparison purposes. In step two, the PTELL adjustment in

the GSA formula was eliminated and while holding the entitlement constant the foundation level was increased for each of the Fiscal Years 2000 through 2011. The specified equity indices were calculated. Step three eliminated the Hold Harmless component of the GSA formula and while holding the entitlement constant the foundation level was increased for each of the Fiscal Years 2000 through 2010. The specified equity indices were calculated. Step four combined the elimination of both the PTELL adjustment and the Hold Harmless component. The entitlement amount was held constant and the foundation level was increased for each of the Fiscal Years 2000 through 2010. Once again, the specified equity indices were calculated. Finally, in step five, all of the equity indices were compared, within school district type, to determine how the two major adjustments to the GSA formula (PTELL adjustment and Hold Harmless) affected equity in the Illinois funding system.

Chapter IV presents the findings and analysis regarding the five research questions. Chapter V summarizes the study and the findings and discusses the implications for education policy makers.

CHAPTER IV

ANALYSIS OF THE DATA

This chapter reviews the design of the study and describes the findings of the data analyses.

Review of the Study

The focus of the study was to assess horizontal equity and equal opportunity (wealth neutrality) in Illinois school funding. The components of the Illinois funding system, utilized in this study, included General State Aid (GSA), GSA Hold Harmless, corporate personal property replacement tax (CPPRT), and local property tax revenue. This study consisted of four scenarios that measure equity in the Illinois funding system. The first two scenarios were conducted over a 12-year period (2000–2011), while the last two scenarios were conducted over an 11-year period, because the GSA Hold Harmless was eliminated in 2011. The measures used to analyze horizontal equity were the McLoone Index and coefficient of variation. A simple regression, as measured by the simple regression coefficient, was used to analyze wealth neutrality. A multiple regression, as measured by a change in coefficient of determination (R^2) was used to analyze conditional wealth neutrality.

In the first scenario, baseline measurements of equity in the Illinois funding system were calculated. These baseline indices were used as

comparisons in the other three scenarios.

The second scenario included a simulation concerning the Property Tax Extension Limitation Law (PTELL) adjustment in the GSA Formula. The PTELL adjustment was eliminated and the associated savings was used to increase the GSA foundation level. The equity measures were calculated to determine the effect that the PTELL adjustment had on the equity in the Illinois funding system. The simulated indices were compared to the baseline equity indices from the first scenario.

The third scenario involved a simulation regarding the Hold Harmless component of the GSA Formula. The GSA Hold Harmless component was eliminated and the associated savings was used to increase the GSA foundation level. The equity measures were calculated to determine the effect that the GSA Hold Harmless component had on equity in the Illinois funding system. Once again, the simulated equity indices were compared to the baseline indices from the first scenario.

The final scenario involved a simulation that combined the prior two simulations. The PTELL adjustment and GSA Hold Harmless were both eliminated and the combined associated savings was used to increase the GSA foundation level. The simulated equity measures were calculated and compared to the baseline equity indices to determine the effect of scenario four on equity in the Illinois funding system.

Findings

Background Data

As seen in Table 2, Illinois school districts experienced changes between 2000 and 2011. The number of school districts decreased from 896 in 2000 to 867 in 2011, a 3.2% change. The largest decrease occurred in unit school districts at 5%. Over the time period the percentage of school districts by type remained fairly constant at 43% elementary districts, 12% high school districts, and 45% unit districts.

During this time, the GSA foundation level increased 9 of the 11 years with only the 2003 and 2011 years remaining flat. The largest increase of $400 (7.5%) was in 2008. The GSA foundation level ranged from $4,325 in 2000 up to $6,119 in 2011, a 41% increase over the time period. In addition, the GSA appropriation also increased 9 of the 11 years with the only decrease occurring in 2003 and a flat appropriation in 2011. The largest percentage increase in the GSA appropriation occurred in 2004 at 9.7% but the largest dollar amount increase ($308,381,800) occurred in 2008. The GSA appropriation increased 54% from 2000 to 2011.

As seen in Tables 3 through 5, the percentage of school districts statewide that were subject to PTELL increased from 41.2% in 2000 to 53.1% in 2011 (an increase of 91 school districts). The statewide associated cost of the PTELL adjustment ranged from $46 million in 2000 to $793 million in 2010 and then decreased in 2011 to $638 million (a total of $5.14 billion).

Table 2

Statewide School Funding Data 2000-2011

	Number of School Districts				GSA Foundation Level			GSA Appropriation		
	Elementary	High School	Unit	Total	Amount	Change $	Change %	Amount	Change $	Change %
2000	384	103	409	896	$4,325	NA	NA	$2,982,563,600	NA	NA
2001	383	103	408	894	$4,425	$100	2.31%	$2,994,715,000	$12,151,400	0.41%
2002	383	103	407	893	$4,560	$135	3.05%	$3,231,727,600	$237,012,600	7.91%
2003	383	103	407	893	$4,560	$0	0.00%	$3,142,100,000	-$89,627,600	-2.77%
2004	381	103	404	888	$4,810	$250	5.48%	$3,445,600,000	$303,500,000	9.66%
2005	379	103	399	881	$4,964	$154	3.20%	$3,682,201,200	$236,601,200	6.87%
2006	377	102	395	874	$5,164	$200	4.03%	$3,903,969,600	$221,768,400	6.02%
2007	376	102	395	873	$5,334	$170	3.29%	$4,146,118,200	$242,148,600	6.20%
2008	378	102	390	870	$5,734	$400	7.50%	$4,454,500,000	$308,381,800	7.44%
2009	378	101	390	869	$5,959	$225	3.92%	$4,581.561,600	$127,061,600	2.85%
2010	378	101	389	868	$6,119	$160	2.69%	$4,600,305,100	$18,743,500	0.41%
2011	378	101	388	867	$6,119	$0	0.00%	$4,600,305,100	$0	0.00%

During the 11-year period, the GSA Hold Harmless component generated a total of $403.7 million. Over the time period, elementary school districts accounted for 31%, high school districts had 25% and unit school districts at 44%. The yearly amount ranged from $19.6 million in 2007 up to $65.8 million in 2001. The number of eligible districts ranged from 80 in 2008 up to 315 in 2001.

For elementary school districts (See Table 3), the number of elementary school districts subject to the PTELL adjustment increased by 17.1% in 2011 compared to 2000 from 228 to 267 districts. Also, during the 12-year time period the percentage of elementary school districts subject to PTELL ranged from 59% to 71%. On average, elementary school districts accounted for 59% of the total school districts subject to PTELL. Also, elementary school districts accounted for 13.5% of the total associated cost of the PTELL adjustment with the amount ranging from $804,409 up to $132 million (2010).

The GSA Hold Harmless component for elementary school districts ranged from $6.1 million (61 districts) in 2002 up to $19.9 million (54 districts) in 2010. Elementary school districts accounted for $124.2 million of the total $403.7 million of the component.

When comparing the amount of local revenue received by elementary school districts to the prior year, the percentage change ranged from 4.3% (2002) to 7.6% (2008). The percentage change in state revenue was more erratic with a decrease of 2.5% in 2003 and the largest increase of 11% in 2004.

Table 4 contained data regarding high school districts. The number of high school districts subject to the PTELL adjustment increased by 15.8% from

57 to 66 districts in 2011 compared to 2000. Also, during the 12-year time period the percentage of high school districts subject to PTELL ranged from 55% to 66%. On average, high school districts accounted for 14% of the total school districts subject to PTELL. High school districts accounted for only 6.7% of the total associated cost of the PTELL adjustment with the amount ranging from $169,876 up to $67.5 million (2010).

The GSA Hold Harmless component for high school districts ranged from $1.1 million (10 districts) in 2007 up to $24.4 million (73 districts) in 2001. High school districts accounted for $101.9 million of the total $403.7 million of the component.

When comparing the amount of local revenue received by high school districts to the prior year, the percentage change ranged from 3.5% (2002) to 7.2% (2008). The percentage change in state revenue was more erratic with a decrease of 3.7% in 2003 and the largest increase of 17.7% in 2004.

Unit school districts accounted for an average of 27% of the total school districts subject to PTELL (See Table 5.). The number of unit school districts subject to the PTELL adjustment increased by 51.2% in 2011 compared to 2000 from 84 to 127 districts. Also, during the 12-year time period the percentage of unit school districts subject to PTELL ranged from 21% to 33%. Unit school districts accounted for 79.8% of the total associated cost of the PTELL adjustment with the amount ranging from $45 million up to $612 million (2009).

The GSA Hold Harmless component for unit school districts ranged from $7.8 million (29 districts) in 2008 up to $34.7 million (127 districts) in 2003. Unit

school districts accounted for $177.6 million of the total $403.7 million of the component.

When comparing the amount of local revenue received by unit school districts to the prior year, the percentage change ranged from 3.6% (2011) to 8.0% (2008). The percentage change in state revenue was more erratic with a decrease of 3.5% in 2003 and the largest increase of 8.7% in 2004.

Chicago School District 299 is a unit school district that accounts for approximately 18% of students statewide (as measured by average daily attendance). Because Chicago School District 299 is the largest in the state, it is important to note how the school district impacted the PTELL adjustment and GSA Hold Harmless. Of the total $5.14 billion associated cost of the PTELL adjustment, Chicago School District 299 accounted for 66% ($3.4 billion). The annual amount and percentage of the PTELL adjustment associated with Chicago School District 299 fluctuated throughout the time period, the amount ranged from $34 million to $524 million (54.2% to 89.3%). However Chicago School District 299 did not account for any of the GSA Hold Harmless component.

Table 3

School Funding Data for Elementary School Districts, 2000-2011

	Subject to PTELL			Subject to Hold Harmless			Change in Revenue	
Year	# Districts	% Districts	Cost	# Districts	% Districts	Cost	Local %	State %
2000	228	59.38	$ 804,409	104	27.08	$7,906,041	NA	NA
2001	228	59.53	$3,861,569	116	30.29	$11,355,828	4.58	2.16
2002	263	68.67	$20,120,395	61	15.93	$6,122,817	4.31	9.39
2003	269	70.23	$10,232,208	86	22.45	$11,820,412	5.44	-2.49
2004	269	70.60	$14,798,233	53	13.91	$8,488,565	5.43	10.96
2005	268	70.71	$60,369,206	52	13.72	$9,354,291	5.73	6.28
2006	267	70.82	$60,424,001	43	11.41	$8,864,128	7.14	5.33
2007	267	71.01	$61,952,448	48	12.77	$9,691,487	6.14	5.58
2008	267	70.63	$95,934,579	45	11.90	$14,537,668	7.56	7.25
2009	267	70.63	$114,898,089	47	12.43	$16,155,041	7.41	2.73
2010	267	70.63	$132,042,747	54	14.29	$19,933,128	5.70	2.44
2011	267	70.63	$116,725,770	NA	NA	NA	4.99	1.93

Table 4

School Funding Data for High School Districts, 2000-2011

	Subject to PTELL			Subject to Hold Harmless			Change in Revenue	
Year	# Districts	% Districts	Cost	# Districts	% Districts	Cost	Local %	State %
2000	57	55.34	$169,876	76	73.79	$23,825,795	NA	NA
2001	57	55.34	$1,156,497	73	70.87	$24,397,426	4.17	1.92
2002	65	63.11	$8,936,802	54	52.43	$13,440,100	3.51	13.38
2003	67	65.05	$3,772,141	59	57.28	$17,682,367	5.04	-3.66
2004	67	65.05	$4,735,758	36	34.95	$9,455,270	5.01	17.66
2005	67	65.05	$25,512,581	25	24.27	$4,882,673	5.67	11.53
2006	67	65.69	$29,818,353	14	13.73	$2,494,994	5.33	12.59
2007	67	65.69	$32,110,605	10	9.80	$1,082,686	5.52	9.35
2008	67	65.69	$52,991,034	6	5.88	$1,118,042	7.24	11.40
2009	66	65.35	$61,674,761	7	6.93	$1,140,753	6.36	4.08
2010	66	65.35	$67,498,867	8	7.92	$2,326,266	5.21	0.04
2011	66	65.35	$58,288,420	NA	NA	NA	4.53	0.82

Table 5

School Funding Data for Unit School Districts, 2000-2011

	Subject to PTELL			Subject to Hold Harmless			Change in Revenue	
Year	# Districts	% Districts	Cost	# Districts	% Districts	Cost	Local %	State %
2000	84	20.54	$45,023,744	81	19.80	$16,222,447	NA	NA
2001	102	25.00	$47,145,527	126	30.88	$30,091,381	4.42	0.17
2002	108	26.54	$72,479,792	79	19.41	$15,099,211	3.78	7.52
2003	119	29.24	$185,132,969	127	31.20	$34,655,420	5.38	-3.53
2004	124	30.69	$185,669,699	80	19.80	$19,049,250	5.94	8.68
2005	123	30.83	$271,450,024	61	15.29	$12,839,444	3.69	6.65
2006	125	31.65	$490,365,891	42	10.63	$10,228,806	5.33	5.29
2007	127	32.15	$530,034,766	37	9.37	$8,820,419	4.71	5.73
2008	127	32.56	$603,239,993	29	7.44	$7,817,181	7.95	7.07
2009	127	32.56	$612,449,797	32	8.21	$9,153,431	7.31	3.36
2010	127	32.65	$593,124,957	39	10.0	$13,613,882	5.01	0.47
2011	127	32.73	$463,095,905	NA	NA	NA	3.59	-1.33

Research Question 1

> What were the equity indices in the Illinois GSA funding system from Fiscal Year 2000 through Fiscal Year 2011 as computed by the four standard equity measures: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

This research question dealt with calculating baseline measurements of equity in the Illinois funding system. The McLoone Index and coefficient of variation were used to measure the horizontal equity in the system. The simple regression coefficient and multiple regression change in the coefficient of determination were used to measure the equal opportunity of the funding system. Tables 6 through 9 contain the computations regarding one of the equity measures for the three school district types (elementary, high school, and unit).

McLoone index. The formula for calculating the McLoone Index utilizes the revenues per pupil for each school district and the median level of revenues per pupil by school district type. The index is a ratio of the sum of revenues per pupil for school districts below the median level to the sum if all pupils below the median were at the median level. The closer the ratio is to 1 the more horizontal equity is associated with the funding system. The revenues were defined as the sum of General State Aid, corporate personal property replacement tax, and local property tax revenue.

As shown in Table 6, the median levels of revenues per pupil for elementary and unit school districts over the 12-year period were very similar. Elementary school districts ranged from $4,978 to $8,305 and unit school

districts ranged from $4,881 to $7,483. However, the median levels of revenues per pupil for high school districts were quite a bit higher, ranging from $7,051 to $10,827.

Unit school districts had the more equitable indices over the time period ranging from .9364 (2011) to .9522 (2000) but only had 2 years (2005 and 2008) where the index improved over the prior year. The McLoone Index for elementary school districts ranged from .8807 (2011) to .9164 (2004) but only had 3 years (2002, 2004, and 2007) where the index improved over the prior year. Finally high school districts had indices that ranged from .8156 (2005) to .8444 (2002), but equity improved over the prior year in 6 years of the time period.

Coefficient of variation. The purpose of the coefficient of variation is to measure the disparity in the revenues per pupil by school district type. This was the second measure used to assess the horizontal equity in the funding system. The same definitions for district revenues and student counts were used. The index is calculated by dividing the standard deviation by the mean and multiplying by 100. The closer the index is to zero the more horizontal equity that is associated with the funding system.

As seen in Table 7, the index for elementary school districts ranged from 28.00 (more equity) in 2002 to 34.86 (less equity) in 2011. The index improved over the previous year in only one year (2002). High school districts had the best equity index in 2006 at 29.91 to the worst equity index of 33.92 in 2000. However, high school districts had 6 years where the index improved over the

previous year. Unit school districts had an index that ranged from 13.52 (2005) to 17.93 (2011). Also, there were 3 years (2002, 2004, and 2005) where equity improved for unit school districts over the previous year.

In analyzing the coefficient of variation indices for the 12-year period, the funding system was more equitable for unit school districts. Elementary and high school districts had very similar and higher (less equitable) indices than unit school districts.

Simple regression coefficient. The regression coefficient was used to analyze the wealth neutrality of the funding system. School district revenue per pupil was used as the dependent variable and school district wealth (equalized assessed valuation per pupil) was used as the independent variable. The less of a relationship between district revenue and wealth (regression coefficient closer to zero) the more wealth neutral or more equitable is the funding system.

In reviewing the indices in Table 8, one can see that unit school districts had the lowest (most equitable) indices that ranged from .1289 (2008) to .1509 (2011). There were 4 years (2002, 2005, 2007, and 2008) that the equity index improved over the previous year. Elementary school districts were next with respect to equity in the funding system. The indices ranged from .2306 in 2000 to .2919 in 2011. There were only 3 years (2002, 2004, and 2007) where the index improved over the previous year**.** The majority of years the index worsened which means that the relationship between revenue and wealth strengthened and equity declined. Although high school districts were third with the values of the regression coefficients, the long-term pattern was the reverse of

the result of the elementary school districts. The high school districts began at a low equity point of .4539 in 2000 and steadily improved to .3469 in 2010. There was a decline to .3673 in 2011, but there were 9 years where the index improved over the prior year.

Multiple regression. A multiple regression was used to analyze conditional wealth neutrality. This measure is similar to wealth neutrality, in that, it provides a calculation to determine the strength of the relationship between district revenue and district wealth but it goes further by controlling for the effect of the district tax rate. The multiple regression consisted of two steps. The first step determined the effect that the local district tax rate had on the district revenue. The second step determined the effect that both the district tax rate and district wealth had on revenue. The change in R^2 from step one to step two is the amount measured. Once again the closer the change in R^2 is to zero the weaker the relationship between district revenue and district wealth, which is equated to movement toward equity.

Table 9 contains the change in R^2 by school district type for the 12-year time period. The change in R^2 ranged from .5537 (2000) to .6416 (2011) for elementary school districts. Only 3 years (2002, 2007, and 2008) indicated improvement in the equity index compared to the previous year. Except for a few years, the equity indices continued to decline during the time period for elementary school districts. The high school districts had indices that ranged from .7480 (2003) to .8673 (2008). There were 4 years (2001, 2003, 2006, and 2009) where high school districts had improved equity indices compared to the

previous year. Although the indices for high school districts were more erratic and values were larger than elementary school districts, the indices worsened over the time period similar to the elementary school districts. Unit school districts had the lowest (most equitable) values for the change in R^2 indices among the various school district types and ranged from .2863 (2005) to .3748 (2000). Unit school districts also had six years where the equity indices improved over the previous year, with 5 years running consecutively from 2001 to 2005. After 2005 the indices for unit school districts steadily became less equitable (except for 2008) and ended up at .3723 in 2011 not very different from the index of .3748 in 2000.

Comparison across measures. When analyzing data across all four equity measures and school district types that appear in Tables 6 through 9, some major findings emerge. Unit school districts consistently had the more equitable indices and elementary school districts were second. For the most part elementary and unit school districts had equity indices that worsened over the 12-year time period across the four equity measures. High school districts had the less equitable indices over the four measures. However, the equity indices for high school districts improved over the 12-year period for all measures except for the conditional wealth neutrality.

Table 6

McLoone Index by School District Type

Year	Elementary			High School			Unit			Foundation Level
	Median	Index	Equity Improved	Median	Index	Equity Improved	Median	Index	Equity Improved	
2000	$4,978	.9098	NA	$7,051	.8292	NA	$4,881	.9522	NA	$4,325
2001	$5,166	.9043		$7,321	.8195		$4,989	.9520		$4,425
2002	$5,347	.9114	Y	$7,392	.8444	Y	$5,224	.9494		$4,560
2003	$5,437	.9098		$7,820	.8182		$5,295	.9477		$4,560
2004	$5,736	.9164	Y	$8,061	.8340	Y	$5,612	.9453		$4,810
2005	$6,067	.9063		$8,622	.8156		$5,840	.9465	Y	$4,964
2006	$6,404	.9051		$8,874	.8230	Y	$6,119	.9449		$5,164
2007	$6,660	.9090	Y	$9,089	.8285	Y	$6,395	.9430		$5,334
2008	$7,173	.9087		$9,495	.8433	Y	$6,835	.9486	Y	$5,734
2009	$7,604	.9058		$10,083	.8361		$7,162	.9438		$5,959
2010	$8,006	.8975		$10,378	.8423	Y	$7,394	.9419		$6,119
2011	$8,305	.8807		$10,827	.8362		$7,483	.9364		$6,119

Note. The median is the median level of district revenues per pupil. The equity improved column is based upon a comparison to the prior year.

Table 7

Coefficient of Variation by School District Type

Year	Elementary		High School		Unit		Foundation Level
	Index	Equity Improved	Index	Equity Improved	Index	Equity Improved	
2000	28.81	NA	33.92	NA	14.07	NA	$4,325
2001	29.00		32.38	Y	14.63		$4,425
2002	28.00	Y	31.05	Y	14.04	Y	$4,560
2003	28.93		31.27		14.60		$4,560
2004	29.61		30.45	Y	13.84	Y	$4,810
2005	29.95		30.35	Y	13.52	Y	$4,964
2006	31.22		29.91	Y	13.94		$5,164
2007	31.33		30.39		14.19		$5,334
2008	31.33		30.18	Y	14.36		$5,734
2009	31.90		30.53		15.52		$5,959
2010	32.86		31.43		16.79		$6,119
2011	34.86		32.14		17.93		$6,119

Note. The equity improved column is based upon a comparison to the prior year.

Table 8

Wealth Neutrality Criterion by School District Type: Simple Regression Coefficient

Year	Elementary		High School		Unit		Foundation Level
	Index	Equity Improved	Index	Equity Improved	Index	Equity Improved	
2000	.2306	NA	.4539	NA	.1498	NA	$4,325
2001	.2356		.4452	Y	.1501		$4,425
2002	.2313	Y	.4345	Y	.1412	Y	$4,560
2003	.2464		.4397		.1455		$4,560
2004	.2436	Y	.4096	Y	.1456		$4,810
2005	.2443		.4041	Y	.1433	Y	$4,964
2006	.2561		.3885	Y	.1459		$5,164
2007	.2496	Y	.3627	Y	.1355	Y	$5,334
2008	.2526		.3567	Y	.1289	Y	$5,734
2009	.2558		.3491	Y	.1323		$5,959
2010	.2666		.3469	Y	.1399		$6,119
2011	.2919		.3673		.1509		$6,119

Note. The equity improved column is based upon a comparison to the prior year.

Table 9

Conditional Wealth Neutrality Criterion by School District Type: Change in R^2

Year	Elementary		High School		Unit		Foundation Level
	Index	Equity Improved	Index	Equity Improved	Index	Equity Improved	
2000	.5537	NA	.7576	NA	.3748	NA	$4,325
2001	.5590		.7540	Y	.3488	Y	$4,425
2002	.5540	Y	.7629		.3123	Y	$4,560
2003	.5722		.7480	Y	.2989	Y	$4,560
2004	.5801		.8067		.2937	Y	$4,810
2005	.5923		.8463		.2863	Y	$4,964
2006	.6092		.8319	Y	.2910		$5,164
2007	.6027	Y	.8559		.3164		$5,334
2008	.5995	Y	.8673		.3065	Y	$5,734
2009	.6116		.8542	Y	.3517		$5,959
2010	.6139		.8633		.3606		$6,119
2011	.6416		.8648		.3723		$6,119

Note. The equity improved column is based upon a comparison to the prior year.

Research Question 2

> When eliminating the PTELL adjustment in the Illinois GSA formula and holding the entitlement constant by increasing the foundation level, what are the equity indices in the GSA funding system from Fiscal Year 2000 through Fiscal Year 2011 as computed by the four standard equity measures: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

This research question dealt with a simulation of the Illinois funding system that consisted of recalculating the GSA formula without the PTELL adjustment for the 12-year period. The cost associated with the PTELL adjustment was used to increase the GSA foundation level. The McLoone Index and coefficient of variation were used to measure the horizontal equity in the system. The simple regression coefficient and multiple regression change in the coefficient of determination were used to measure the equal opportunity (wealth neutrality) of the funding system. Tables 10 through 13 contain the data regarding one of the equity measures for the three school district types (elementary, high school, and unit). The simulated foundation level displays the dollar and percentage change in the foundation level due to the simulation and is repeated on each of the tables.

McLoone index. The formula for calculating the McLoone Index utilizes the revenues per pupil for each school district and the median level of revenues per pupil by school district type. The index is a ratio of the sum of revenues per pupil for school districts below the median level to the sum if all pupils below the median were at the median level. The closer the index is to 1 the more

horizontal equity is associated with the funding system. The revenues were defined as the sum of General State Aid, corporate personal property replacement tax, and local property tax revenue.

As shown in Table 10, unit school districts had the more equitable simulated indices over the time period ranging from .9303 (2011) to .9719 (2008) and the simulated index improved over the baseline index in all years except for 2011. The McLoone Index for elementary school districts ranged from .8835 (2011) to .9258 (2004) and the simulated indices improved in all years except for 2001, 2009, and 2010. Finally high school districts had indices that ranged from .8229 (2001) to .8704 (2009) and the simulated indices improved in all years except for 2004.

Coefficient of variation. The purpose of the coefficient of variation is to measure the disparity in the revenues per pupil by school district type. This was the second measure used to assess the horizontal equity in the funding system. The same definitions for district revenues and student counts were used. The index is calculated by dividing the standard deviation by the mean and multiplying by 100. The closer the index is to zero the more horizontal equity that is associated with the funding system.

Table 11 shows that unit school districts had the more equitable simulated indices, with values ranging from 12.47 (2006) to 15.59 (2011). Although the simulated indices improved over the baseline indices in every year, the equity still worsened over the 12-year time period. The simulated indices for elementary school districts ranged from 27.72 in 2002 to 32.61 in 2011. Every year the

simulated indices improved compared to the baseline indices. Also like unit school districts, the simulated equity indices worsened over time. The simulated indices for high school districts ranged from 27.88 (2009) to 33.69 (2000). The simulated indices were more equitable compared to the baseline indices for every year. However, unlike the elementary and unit school districts, the simulated indices for high school districts became more equitable over the time period.

Simple regression coefficient. The regression coefficient was used to measure the wealth neutrality of the funding system. School district revenue per pupil was used as the dependent variable and school district wealth (equalized assessed valuation per pupil) was used as the independent variable. The less of a relationship between district revenue and wealth (regression coefficient closer to zero) the more wealth neutral or more equitable is the funding system.

In reviewing the indices in Table 12, it can be seen that unit school districts had the lowest (most equitable) values of the simulated indices that ranged from .0954 (2009) to .1475 (2000). Elementary school districts had a range of .2118 in 2009 to .2552 in 2011 for the simulated indices. High school districts began the time period at .4498 and steadily improved to .2959 in 2010. There was a worsening of the simulated indices to .3238 in 2011. The simulated indices improved every year for all three school district types. For the most part, high school districts and unit school districts had simulated indices that steadily decreased (was more equitable) over the 12-year period. The simulated indices for elementary school districts were a little more erratic and ended up less

equitable.

Multiple regression. A multiple regression was used to measure conditional wealth neutrality. This measure is similar to wealth neutrality, in that, it provides a calculation to determine the strength of the relationship between district revenue and district wealth but it goes further by controlling for the effect of the district tax rate. The multiple regression consisted of two steps. The first step determined the effect that the local school district tax rate had on the school district revenue. The second step determined the effect that both the district tax rate and district wealth had on revenue. The change in R^2 for step one to step two is the amount measured. Once again the closer the change in R^2 is to zero the weaker the relationship between school district revenue and wealth, which is equated to movement toward equity.

Table 13 contains the change in R^2 by school district type for the 12-year time period. The simulated change in R^2 ranged from .5416 (2009) to .5981 (2011) for elementary school districts. The high school districts had a simulated index that ranged from .7377 (2003) to .8300 (2005). Unit school districts had the lowest (more equitable) values for the simulated change in R^2 index that ranged from .2394 (2006) to .3703 (2000).

All school district types had improved equity indices, across all years, when the simulated index was compared to the baseline index. When analyzing the pattern of the simulated index, the values for elementary and high school districts fluctuated up and down throughout the time period. However, the pattern for unit school districts was improvement for 6 years and then the values

fluctuated like the elementary and high school districts.

Comparison across measures. When analyzing data across all four equity measures and school district types that appear in Tables 10 through 13, some major findings emerge. Unit school districts consistently had the most equitable simulated equity indices and elementary school districts were second. For the most part elementary school districts had equity indices that worsened across all four equity measures. Unit school districts had simulated equity indices that worsened over the 12-year period when analyzing the McLoone Index and coefficient of variation but had improvement in the simulated indices for the simple and multiple regressions. High school districts had the least equitable simulated indices over the measures. However, the equity indices for high school districts improved over the 12-year period for all measures except for the conditional wealth neutrality.

Table 10

McLoone Index by School District Type Baseline Compared to Simulated (Elimination of PTELL Adjustment)

Year	Elementary			High School			Unit			Simulated Foundation Level	
	Baseline	Simulated		Baseline	Simulated		Baseline	Simulated		$ Change	% Change
2000	.9098	.9123	Y	.8292	.8311	Y	.9522	.9527	Y	36	0.83
2001	.9043	.9037		.8195	.8229	Y	.9520	.9524	Y	41	0.93
2002	.9114	.9183	Y	.8444	.8487	Y	.9494	.9541	Y	71	1.56
2003	.9098	.9234	Y	.8182	.8305	Y	.9477	.9487	Y	146	3.20
2004	.9164	.9258	Y	.8340	.8315		.9453	.9504	Y	140	2.91
2005	.9063	.9209	Y	.8156	.8400	Y	.9465	.9477	Y	242	4.88
2006	.9051	.9063	Y	.8230	.8514	Y	.9449	.9653	Y	390	7.55
2007	.9090	.9111	Y	.8285	.8627	Y	.9430	.9702	Y	419	7.86
2008	.9087	.9128	Y	.8433	.8627	Y	.9486	.9719	Y	514	8.96
2009	.9058	.9044		.8361	.8704	Y	.9438	.9573	Y	707	11.86
2010	.8975	.8873		.8423	.8486	Y	.9419	.9510	Y	738	12.06
2011	.8807	.8835	Y	.8362	.8474	Y	.9364	.9303		632	10.33

Note. When comparing simulated to baseline a “Y” indicates an improvement in the equity measure.

Table 11

Coefficient of Variation by School District Type Baseline Compared to Simulated (Elimination of PTELL Adjustment)

	Elementary			High School			Unit			Simulated Foundation Level	
Year	Baseline	Simulated		Baseline	Simulated		Baseline	Simulated		$ Change	% Change
2000	28.81	28.53	Y	33.92	33.69	Y	14.07	13.91	Y	36	0.83
2001	29.00	28.74	Y	32.38	32.16	Y	14.63	14.48	Y	41	0.93
2002	28.00	27.72	Y	31.05	30.65	Y	14.04	13.80	Y	71	1.56
2003	28.93	27.98	Y	31.27	30.47	Y	14.60	13.95	Y	146	3.20
2004	29.61	28.78	Y	30.45	29.71	Y	13.84	13.25	Y	140	2.91
2005	29.95	28.99	Y	30.35	29.12	Y	13.52	12.54	Y	242	4.88
2006	31.22	29.36	Y	29.91	28.18	Y	13.94	12.47	Y	390	7.55
2007	31.33	29.34	Y	30.39	28.61	Y	14.19	12.67	Y	419	7.86
2008	31.33	29.24	Y	30.18	28.14	Y	14.36	12.57	Y	514	8.96
2009	31.90	29.06	Y	30.53	27.88	Y	15.52	13.08	Y	707	11.86
2010	32.86	30.11	Y	31.43	28.82	Y	16.79	14.25	Y	738	12.06
2011	34.86	32.61	Y	32.14	29.95	Y	17.93	15.59	Y	632	10.33

Note. When comparing simulated to baseline a “Y” indicates an improvement in the equity measure.

Table 12

Wealth Neutrality Criterion by School District Type: Simple Regression Coefficient Baseline Compared to Simulated (Elimination of PTELL Adjustment)

Year	Elementary			High School			Unit			Simulated Foundation Level	
	Baseline	Simulated		Baseline	Simulated		Baseline	Simulated		$ Change	% Change
2000	.2306	.2271	Y	.4539	.4498	Y	.1498	.1475	Y	36	0.83
2001	.2356	.2317	Y	.4452	.4405	Y	.1501	.1467	Y	41	0.93
2002	.2313	.2264	Y	.4345	.4275	Y	.1412	.1360	Y	71	1.56
2003	.2464	.2336	Y	.4397	.4241	Y	.1455	.1353	Y	146	3.20
2004	.2436	.2316	Y	.4096	.3955	Y	.1456	.1363	Y	140	2.91
2005	.2443	.2259	Y	.4041	.3802	Y	.1433	.1276	Y	242	4.88
2006	.2561	.2272	Y	.3885	.3533	Y	.1459	.1217	Y	390	7.55
2007	.2496	.2193	Y	.3627	.3267	Y	.1355	.1093	Y	419	7.86
2008	.2526	.2183	Y	.3567	.3140	Y	.1289	.1009	Y	514	8.96
2009	.2558	.2118	Y	.3491	.2967	Y	.1323	.0954	Y	707	11.86
2010	.2666	.2230	Y	.3469	.2959	Y	.1399	.0955	Y	738	12.06
2011	.2919	.2552	Y	.3673	.3238	Y	.1509	.1121	Y	632	10.33

Note. When comparing simulated to baseline a “Y” indicates an improvement in the equity measure.

Table 13

Conditional Wealth Neutrality Criterion by School District Type: Change in R^2 Baseline Compared to Simulated (Elimination of PTELL Adjustment)

	Elementary			High School			Unit			Simulated Foundation Level	
Year	Baseline	Simulated		Baseline	Simulated		Baseline	Simulated		$ Change	% Change
2000	.5537	.5489	Y	.7576	.7554	Y	.3748	.3703	Y	36	0.83
2001	.5590	.5523	Y	.7540	.7498	Y	.3488	.3394	Y	41	0.93
2002	.5540	.5418	Y	.7629	.7605	Y	.3123	.2977	Y	71	1.56
2003	.5722	.5539	Y	.7480	.7377	Y	.2989	.2787	Y	146	3.20
2004	.5801	.5608	Y	.8067	.7967	Y	.2937	.2746	Y	140	2.91
2005	.5923	.5510	Y	.8463	.8300	Y	.2863	.2539	Y	242	4.88
2006	.6092	.5599	Y	.8319	.8010	Y	.2910	.2394	Y	390	7.55
2007	.6027	.5525	Y	.8559	.8220	Y	.3164	.2558	Y	419	7.86
2008	.5995	.5437	Y	.8673	.8250	Y	.3065	.2445	Y	514	8.96
2009	.6116	.5416	Y	.8542	.8012	Y	.3517	.2705	Y	707	11.86
2010	.6139	.5504	Y	.8633	.8137	Y	.3606	.2643	Y	738	12.06
2011	.6416	.5981	Y	.8648	.8288	Y	.3723	.2966	Y	632	10.33

Note. When comparing simulated to baseline a “Y” indicates an improvement in the equity measure.

Research Question 3

> When eliminating the Hold Harmless component in the Illinois GSA formula and holding the entitlement constant by increasing the foundation level, what are the equity indices in the GSA funding system from Fiscal Year 2000 through Fiscal Year 2010 as computed by the four standard equity measures: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

This research question dealt with a simulation of the Illinois funding system that consisted of recalculating the GSA formula without the GSA Hold Harmless component for the 11-year period. The cost associated with the GSA Hold Harmless component was used to increase the GSA foundation level. The McLoone Index and coefficient of variation were used to measure the horizontal equity in the system. The simple regression coefficient and multiple regression change in the coefficient of determination were used to measure the equal opportunity (wealth neutrality and conditional wealth neutrality) of the funding system. Tables 14 through 17 contain the data regarding one of the equity measures for the three school district types (elementary, high school, and unit). The simulated foundation level displays the dollar and percentage change in the foundation level due to the simulation and is repeated on each of the tables.

McLoone index. The formula for calculating the McLoone Index utilizes the revenues per pupil for each school district and the median level of revenues per pupil by school district type. The index is a ratio of the sum of revenues per pupil for school districts below the median level to the sum if all pupils below the median were at the median level. The closer the index is to 1 the more

horizontal equity is associated with the funding system. The revenues were defined as the sum of General State Aid, corporate personal property replacement tax, and local property tax revenue.

As shown in Table 14, unit school districts had the more equitable simulated indices over the time period ranging from .9421 (2010) to .9525 (2000) and the simulated indices improved over the baseline indices in all years except for 2009. The simulated indices for elementary school districts ranged from .8987 (2010) to .9164 (2004) and the simulated index improved in all years except for 2004 and 2009. Finally high school districts had indices that ranged from .8173 (2005) to .8448 (2002) and the simulated indices improved in all years.

Coefficient of variation. The purpose of the coefficient of variation is to measure the disparity in the revenues per pupil by school district type. This was the second measure used to assess the horizontal equity in the funding system. The same definitions for district revenues and student counts were used. The index is calculated by dividing the standard deviation by the mean and multiplying by 100. The closer the index is to zero the more horizontal equity that is associated with the funding system.

Table 15 shows that the unit school districts had the more equitable simulated indices with values ranging from 13.45 (2005) to 16.69 (2010). The simulated indices for elementary school districts ranged from 27.81 in 2002 to 32.73 in 2010. Finally, the simulated indices for high school districts ranged from 29.84 (2006) to 33.70 (2000). Every year the simulated indices were more

equitable compared to the baseline indices for all school district types. However, unlike the elementary and unit school districts, the simulated indices for high school districts became more equitable over the time period.

Simple regression coefficient. The regression coefficient was used to measure the wealth neutrality of the funding system. School district revenue per pupil was used as the dependent variable and school district wealth (equalized assessed valuation per pupil) was used as the independent variable. The weaker the relationship between district revenue and wealth (regression coefficient closer to zero) the more wealth neutral or more equitable is the funding system.

In reviewing the indices in Table 16, unit school districts had the lowest values (most equitable) of the simulated indices that ranged from .1283 (2008) to .1481 (2000). Elementary school districts had a range of .2272 in 2000 to .2651 in 2010 for the simulated indices. High school districts began the time period at .4501 and steadily improved to .3455 in 2010. The simulated index improved over the baseline index every year for all three school district types. For the most part, high school districts and unit school districts had simulated indices that steadily improved over the time period. However, the simulated indices for elementary school districts became less equitable over the time period.

Multiple regression. A multiple regression was used to measure conditional wealth neutrality. This measure is similar to wealth neutrality, in that, it provides a calculation to determine the strength of the relationship between district revenue and district wealth but it goes further by controlling for the effect

of the district tax rate. The multiple regression consisted of two steps. The first step determined the effect that the local school district tax rate had on the school district revenue. The second step determined the effect that both the district tax rate and district wealth had on revenue. The change in R^2 from step one and step two is the amount measured. Once again the closer the change in R^2 is to zero the weaker the relationship between school district revenue and wealth, which is equated to movement toward equity.

Table 17 contains the change in R^2 by school district type for the 11-year period. The simulated change in R^2 ranged from .5493 (2000) to .6127 (2010) for elementary school districts. The high school districts had a simulated index that ranged from .7457 (2003) to .8672 (2008). Finally, unit school districts had the lowest (most equitable) values for the simulated change in R^2 among the different school district types and ranged from .2851 (2005) to .3736 (2000).

High school and unit districts had improved equity indices, across all years, when the simulated index was compared to the baseline index. Elementary school districts had improved equity indices all years except for 2009. When analyzing the trend of the simulated index, the values for elementary and high school districts fluctuated up and down throughout the time period. However, the trend for unit school districts was improvement for 5 years and then the values fluctuated like the other school district types.

Comparison across measures. When analyzing data across all four equity measures and school district types, unit school districts consistently had the most equitable simulated equity indices and elementary school districts were

second. For the most part elementary school districts had equity indices that worsened across all four equity measures. Unit school districts had simulated equity indices that worsened over the 11-year period when analyzing the McLoone Index and coefficient of variation, but had improvement in the simulated indices for the simple and multiple regressions. High school districts had the less equitable simulated indices over the four measures. However, the equity indices for high school districts improved over the 11-year period for all measures except for the conditional wealth neutrality.

Table 14

McLoone Index by School District Type Baseline Compared to Simulated (Elimination of Hold Harmless Component)

	Elementary			High School			Unit			Simulated Foundation Level	
Year	Baseline	Simulated		Baseline	Simulated		Baseline	Simulated		$ Change	% Change
2000	.9098	.9127	Y	.8292	.8296	Y	.9522	.9525	Y	33	0.76
2001	.9043	.9063	Y	.8195	.8246	Y	.9520	.9524	Y	44	0.99
2002	.9114	.9115	Y	.8444	.8448	Y	.9494	.9496	Y	23	0.50
2003	.9098	.9120	Y	.8182	.8200	Y	.9477	.9480	Y	42	0.92
2004	.9164	.9164		.8340	.8343	Y	.9453	.9455	Y	24	0.50
2005	.9063	.9080	Y	.8156	.8173	Y	.9465	.9466	Y	17	0.34
2006	.9051	.9052	Y	.8230	.8237	Y	.9449	.9450	Y	13	0.25
2007	.9090	.9091	Y	.8285	.8291	Y	.9430	.9431	Y	12	0.22
2008	.9087	.9093	Y	.8433	.8435	Y	.9486	.9487	Y	15	0.26
2009	.9058	.9022		.8361	.8363	Y	.9438	.9437		15	0.25
2010	.8975	.8987	Y	.8423	.8426	Y	.9419	.9421	Y	23	0.38

Note. When comparing simulated to baseline a “Y” indicates an improvement in the equity measure.

Table 15

Coefficient of Variation by School District Type Baseline Compared to Simulated (Elimination of Hold Harmless Component)

	Elementary			High School			Unit			Simulated Foundation Level	
Year	Baseline	Simulated		Baseline	Simulated		Baseline	Simulated		$ Change	% Change
2000	28.81	28.53	Y	33.92	33.70	Y	14.07	13.90	Y	33	0.76
2001	29.00	28.63	Y	32.38	32.10	Y	14.63	14.40	Y	44	0.99
2002	28.00	27.81	Y	31.05	30.90	Y	14.04	13.93	Y	23	0.50
2003	28.93	28.58	Y	31.27	31.01	Y	14.60	14.39	Y	42	0.92
2004	29.61	29.43	Y	30.45	30.31	Y	13.84	13.73	Y	24	0.50
2005	29.95	29.82	Y	30.35	30.26	Y	13.52	13.45	Y	17	0.34
2006	31.22	31.13	Y	29.91	29.84	Y	13.94	13.89	Y	13	0.25
2007	31.33	31.25	Y	30.39	30.33	Y	14.19	14.14	Y	12	0.22
2008	31.33	31.23	Y	30.18	30.10	Y	14.36	14.30	Y	15	0.26
2009	31.90	31.80	Y	30.53	30.46	Y	15.52	15.52		15	0.25
2010	32.86	32.73	Y	31.43	31.34	Y	16.79	16.69	Y	23	0.38

Note. When comparing simulated to baseline a “Y” indicates an improvement in the equity measure.

Table 16

Wealth Neutrality Criterion by School District Type: Simple Regression Coefficient Baseline Compared to Simulated (Elimination of Hold Harmless Component)

	Elementary			High School			Unit			Simulated Foundation Level	
Year	Baseline	Simulated		Baseline	Simulated		Baseline	Simulated		$ Change	% Change
2000	.2306	.2272	Y	.4539	.4501	Y	.1498	.1481	Y	33	0.76
2001	.2356	.2310	Y	.4452	.4402	Y	.1501	.1478	Y	44	0.99
2002	.2313	.2290	Y	.4345	.4320	Y	.1412	.1400	Y	23	0.50
2003	.2464	.2422	Y	.4397	.4352	Y	.1455	.1430	Y	42	0.92
2004	.2436	.2414	Y	.4096	.4073	Y	.1456	.1443	Y	24	0.50
2005	.2443	.2427	Y	.4041	.4025	Y	.1433	.1424	Y	17	0.34
2006	.2561	.2550	Y	.3885	.3874	Y	.1459	.1453	Y	13	0.25
2007	.2496	.2486	Y	.3627	.3618	Y	.1355	.1350	Y	12	0.22
2008	.2526	.2515	Y	.3567	.3557	Y	.1289	.1283	Y	15	0.26
2009	.2558	.2547	Y	.3491	.3481	Y	.1323	.1303	Y	15	0.25
2010	.2666	.2651	Y	.3469	.3455	Y	.1399	.1389	Y	23	0.38

Note. When comparing simulated to baseline a "Y" indicates an improvement in the equity measure.

Table 17

Conditional Wealth Neutrality Criterion by School District Type: Change in R^2 Baseline Compared to Simulated (Elimination of Hold Harmless Component)

Year	Elementary			High School			Unit			Simulated Foundation Level	
	Baseline	Simulated		Baseline	Simulated		Baseline	Simulated		$ Change	% Change
2000	.5537	.5493	Y	.7576	.7559	Y	.3748	.3736	Y	33	0.76
2001	.5590	.5534	Y	.7540	.7513	Y	.3488	.3472	Y	44	0.99
2002	.5540	.5512	Y	.7629	.7618	Y	.3123	.3112	Y	23	0.50
2003	.5722	.5677	Y	.7480	.7457	Y	.2989	.2958	Y	42	0.92
2004	.5801	.5778	Y	.8067	.8057	Y	.2937	.2921	Y	24	0.50
2005	.5923	.5908	Y	.8463	.8457	Y	.2863	.2851	Y	17	0.34
2006	.6092	.6081	Y	.8319	.8315	Y	.2910	.2902	Y	13	0.25
2007	.6027	.6019	Y	.8559	.8556	Y	.3164	.3158	Y	12	0.22
2008	.5995	.5985	Y	.8673	.8672	Y	.3065	.3058	Y	15	0.26
2009	.6116	.6119		.8542	.8540	Y	.3517	.3392	Y	15	0.25
2010	.6139	.6127	Y	.8633	.8629	Y	.3606	.3595	Y	23	0.38

Note. When comparing simulated to baseline a “Y” indicates an improvement in the equity measure.

Research Question 4

> When eliminating the PTELL adjustment and Hold Harmless component in the Illinois GSA formula and holding the entitlement constant by increasing the foundation level, what are the equity indices in the GSA funding system from Fiscal Year 2000 through Fiscal Year 2010 as computed by the four standard equity indices: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

This research question dealt with a simulation of the Illinois funding system that consisted of recalculating the GSA formula without the PTELL adjustment and Hold Harmless component for the 11-year period. The combined cost associated with the PTELL adjustment and Hold Harmless component was used to increase the GSA foundation level. The McLoone Index and coefficient of variation were used to measure the horizontal equity in the system. The simple regression coefficient and multiple regression change in the coefficient of determination were used to measure the equal opportunity (wealth neutrality and conditional wealth neutrality) of the funding system. Tables 18 through 21 contain the data regarding one of the equity measures for the three school district types. The simulated foundation level displays the dollar and percentage change in the foundation level due to the simulation and is repeated on each of the tables.

McLoone index. The formula for calculating the McLoone Index utilizes the revenues per pupil for each school district and the median level of revenues per pupil by school district type. The index is a ratio of the sum of revenues per pupil for school districts below the median level to the sum if all pupils below the median were at the median level. The closer the index is to 1 the more horizontal

equity is associated with the funding system. The revenues were defined as the sum of General State Aid, corporate personal property replacement tax, and local property tax revenue.

As shown in Table 18, unit school districts had more equitable simulated indices over the time period ranging from .9479 (2005) to .9719 (2008) and the simulated index improved over the baseline index in all years. The simulated indices for elementary school districts ranged from .8873 (2010) to .9258 (2004) and the simulated indices improved in all years except for 2009 and 2010. Finally high school districts had simulated indices that ranged from .8274 (2001) to .8703 (2009) and the simulated indices improved in all years except for 2004.

Coefficient of variation. The purpose of the coefficient of variation is to measure the disparity in the revenues per pupil by school district type. This was the second measure used to assess the horizontal equity in the funding system. The same definitions for district revenues and student counts were used. The index is calculated by dividing the standard deviation by the mean and multiplying by 100. The closer the index is to zero the more horizontal equity that is associated with the funding system.

Table 19 shows that the unit school districts had more equitable simulated indices with values ranging from 12.44 (2006) to 14.28 (2001). The simulated indices for elementary school districts ranged from 27.55 in 2002 to 30.01 in 2010. The simulated indices for high school districts ranged from 27.83 (2009) to 33.50 (2000). Every year the simulated index improved compared to the baseline index for all school district types. However, unlike the elementary and unit school

districts, the simulated indices for high school districts became more equitable over the time period.

Simple regression coefficient. The regression coefficient was used to measure the wealth neutrality of the funding system. School district revenue per pupil was used as the dependent variable and school district wealth (equalized assessed valuation per pupil) was used as the independent variable. The weaker the relationship between district revenue and wealth (regression coefficient closer to zero) the more wealth neutral or more equitable is the funding system.

In reviewing the simulated indices in Table 20, unit school districts had the lowest (most equitable) values of the simulated indices that ranged from .0948 (2010) to .1460 (2000). Elementary school districts had a range of .2110 in 2009 to .2308 in 2003 for the simulated indices. High school districts began the time period at .4466 and steadily improved to .2947 in 2010. The simulated index improved every year, for all three school district types, when compared to the baseline index. For the most part, high school districts and unit school districts had simulated indices that steadily improved over the time period. Elementary school districts fluctuated over the time period and ended with an improved index in 2009 but less equitable in 2010.

Multiple regression. The multiple regression was used to measure conditional wealth neutrality. This measure is similar to wealth neutrality, in that, it provides a calculation to determine the strength of the relationship between district revenue and district wealth but it goes further by controlling for the effect of the district tax rate. The multiple regression consisted of two steps. The first step

determined the effect that the local school district tax rate had on the school district revenue. The second step determined the effect that both the district tax rate and district wealth had on revenue. The change in R^2 from step one to step two is the amount measured. Once again the closer the change in R^2 is to zero the weaker the relationship between school district revenue and wealth, which is equated to movement toward equity.

Table 21 contains the change in R^2 by school district type for the 11-year period. The simulated change in R^2 ranged from .5393 (2002) to .5590 (2006) for elementary school districts. The high school districts had a simulated index that ranged from .7359 (2003) to .8293 (2005). Unit school districts had the lowest (most equitable) values for the simulated indices among the different school district types and ranged from .2387 (2006) to .3692 (2000).

All school district types had improved equity indices, across all years, when the simulated index was compared to the baseline index. When analyzing the pattern of the simulated index, the values for elementary and high school districts fluctuated up and down throughout the time period and ended the time period worse. However, the pattern for unit school districts was improvement for six years and then the values fluctuated like elementary and high school districts but still ended up with movement toward equity.

Comparison across measures. When analyzing data across all four equity measures and school district types, unit school districts consistently had the more equitable simulated indices and elementary school districts were second. For the most part elementary school districts had equity indices that worsened

across all equity measures except for the simple regression coefficient. Unit school districts had simulated equity indices that worsened over the 11-year period when analyzing the McLoone Index, but for the most part had improvement in the coefficient of variation (except for 2010). Unit school districts also had improvement in the simulated indices for the simple and multiple regressions. High school districts had the less equitable simulated indices over the four measures. However, the equity indices for high school districts improved over the 11-year period for all measures except for the conditional wealth neutrality.

Table 18

McLoone Index by School District Type Baseline Compared to Simulated (Elimination of PTELL Adjustment and Hold Harmless Component)

	Elementary			High School			Unit			Simulated Foundation Level	
Year	Baseline	Simulated		Baseline	Simulated		Baseline	Simulated		$ Change	% Change
2000	.9098	.9126	Y	.8292	.8315	Y	.9522	.9530	Y	64	1.48
2001	.9043	.9077	Y	.8195	.8274	Y	.9520	.9528	Y	80	1.81
2002	.9114	.9185	Y	.8444	.8490	Y	.9494	.9543	Y	91	2.00
2003	.9098	.9234	Y	.8182	.8308	Y	.9477	.9490	Y	175	3.84
2004	.9164	.9258	Y	.8340	.8317		.9453	.9505	Y	159	3.31
2005	.9063	.9209	Y	.8156	.8401	Y	.9465	.9479	Y	257	5.18
2006	.9051	.9063	Y	.8230	.8514	Y	.9449	.9653	Y	399	7.73
2007	.9090	.9116	Y	.8285	.8632	Y	.9430	.9707	Y	428	8.02
2008	.9087	.9128	Y	.8433	.8630	Y	.9486	.9719	Y	522	9.10
2009	.9058	.9043		.8361	.8703	Y	.9438	.9566	Y	719	12.07
2010	.8975	.8873		.8423	.8499	Y	.9419	.9511	Y	757	12.37

Note. When comparing simulated to baseline a “Y” indicates an improvement in the equity measure.

Table 19

Coefficient of Variation by School District Type Baseline Compared to Simulated (Elimination of PTELL Adjustment and Hold Harmless Component)

	Elementary			High School			Unit			Simulated Foundation Level	
Year	Baseline	Simulated		Baseline	Simulated		Baseline	Simulated		$ Change	% Change
2000	28.81	28.29	Y	33.92	33.50	Y	14.07	13.77	Y	64	1.48
2001	29.00	28.42	Y	32.38	31.91	Y	14.63	14.28	Y	80	1.81
2002	28.00	27.55	Y	31.05	30.53	Y	14.04	13.70	Y	91	2.00
2003	28.93	27.75	Y	31.27	30.29	Y	14.60	13.81	Y	175	3.84
2004	29.61	28.63	Y	30.45	29.60	Y	13.84	13.17	Y	159	3.31
2005	29.95	28.88	Y	30.35	29.03	Y	13.52	12.49	Y	257	5.18
2006	31.22	29.30	Y	29.91	28.13	Y	13.94	12.44	Y	399	7.73
2007	31.33	29.29	Y	30.39	28.57	Y	14.19	12.64	Y	428	8.02
2008	31.33	29.20	Y	30.18	28.10	Y	14.36	12.55	Y	522	9.10
2009	31.90	29.00	Y	30.53	27.83	Y	15.52	13.04	Y	719	12.07
2010	32.86	30.01	Y	31.43	28.75	Y	16.79	14.19	Y	757	12.37

Note. When comparing simulated to baseline a "Y" indicates an improvement in the equity measure.

Table 20

Wealth Neutrality Criterion by School District Type Baseline Compared to Simulated (Elimination of PTELL Adjustment and Hold Harmless Component)

	Elementary			High School			Unit			Simulated Foundation Level	
Year	Baseline	Simulated		Baseline	Simulated		Baseline	Simulated		$ Change	% Change
2000	.2306	.2242	Y	.4539	.4466	Y	.1498	.1460	Y	64	1.48
2001	.2356	.2277	Y	.4452	.4361	Y	.1501	.1448	Y	80	1.81
2002	.2313	.2244	Y	.4345	.4253	Y	.1412	.1350	Y	91	2.00
2003	.2464	.2308	Y	.4397	.4210	Y	.1455	.1339	Y	175	3.84
2004	.2436	.2299	Y	.4096	.3937	Y	.1456	.1353	Y	159	3.31
2005	.2443	.2246	Y	.4041	.3788	Y	.1433	.1268	Y	257	5.18
2006	.2561	.2264	Y	.3885	.3525	Y	.1459	.1213	Y	399	7.73
2007	.2496	.2187	Y	.3627	.3260	Y	.1355	.1090	Y	428	8.02
2008	.2526	.2178	Y	.3567	.3135	Y	.1289	.1006	Y	522	9.10
2009	.2558	.2110	Y	.3491	.2959	Y	.1323	.0951	Y	719	12.07
2010	.2666	.2218	Y	.3469	.2947	Y	.1399	.0948	Y	757	12.37

Note. When comparing simulated to baseline a “Y” indicates an improvement in the equity measure.

Table 21

Conditional Wealth Neutrality Criterion by School District Type: Change in R^2 Baseline Compared to Simulated (Elimination of PTELL Adjustment and Hold Harmless Component)

	Elementary			High School			Unit			Simulated Foundation Level	
Year	Baseline	Simulated		Baseline	Simulated		Baseline	Simulated		$ Change	% Change
2000	.5537	.5451	Y	.7576	.7539	Y	.3748	.3692	Y	64	1.48
2001	.5590	.5472	Y	.7540	.7473	Y	.3488	.3381	Y	80	1.81
2002	.5540	.5393	Y	.7629	.7595	Y	.3123	.2968	Y	91	2.00
2003	.5722	.5506	Y	.7480	.7359	Y	.2989	.2772	Y	175	3.84
2004	.5801	.5589	Y	.8067	.7959	Y	.2937	.2734	Y	159	3.31
2005	.5923	.5495	Y	.8463	.8293	Y	.2863	.2528	Y	257	5.18
2006	.6092	.5590	Y	.8319	.8006	Y	.2910	.2387	Y	399	7.73
2007	.6027	.5517	Y	.8559	.8216	Y	.3164	.2552	Y	428	8.02
2008	.5995	.5430	Y	.8673	.8247	Y	.3065	.2441	Y	522	9.10
2009	.6116	.5407	Y	.8542	.8007	Y	.3517	.2699	Y	719	12.07
2010	.6139	.5490	Y	.8633	.8129	Y	.3606	.2630	Y	757	12.37

Note. When comparing simulated to baseline a “Y” indicates an improvement in the equity measure.

Research Question 5

What are the similarities and differences in the equity indices between and across the different simulations?

This research question was used to compare the four simulations of the study. This study included the analysis of four simulations of the Illinois funding system. The first simulation was the funding system in place. Second was the elimination of the PTELL adjustment to increase the GSA foundation level. The third simulation was the elimination of the GSA Hold Harmless component to increase the GSA foundation level. Finally, the last simulation combined the elimination of the PTELL adjustment and GSA Hold Harmless component to increase the GSA foundation level. The equity measures used to analyze the simulations were the McLoone Index, coefficient of variation, simple regression coefficient, multiple regression (change in R^2). As in the previous questions, the findings are organized by equity measure.

McLoone index. The first simulation contained the baseline McLoone indices that were compared to the prior year to see if there was progress toward equity in the funding system. The baseline indices were rather erratic with the values shifting up and down throughout the time period. Consistently, across all four research questions, the McLoone Index indicated more equity for unit school districts and less equity for high school districts in the funding system. There was improvement in the simulated equity indices (for the last three simulations) in 89% of the years when compared to the baseline equity indices. The main purpose of the last three simulations was to compare to the baseline indices of

the funding system to see how each simulation affected equity. However, it was interesting to note that when the simulated index was compared to the prior year simulated index there were additional years that had improvement in equity. This means that the simulations helped (to a small degree) create a more improved equity pattern over time.

Coefficient of variation. In reviewing the coefficient of variation across the four simulations some interesting patterns emerged. Unit school districts still had the highest level of equity in the school funding system. However, the simulated equity indices for elementary and high school districts were very close with the high school districts having just slightly worse equity indices. The simulated indices improved over the baseline indices for every year and all school district types except for one year (2009) where the indices were the same for unit school districts. The third simulation (elimination of GSA Hold Harmless) had the smallest impact on the equity indices. Although the main purpose was to compare the simulated to baseline indices (for the same year), when comparing simulated to prior year simulated there was improvement in the trend for simulations eliminating the PTELL adjustment.

Simple regression coefficient. The findings for the wealth neutrality measure were similar to the earlier equity measures. Unit school districts had the highest level of equity in the school funding system with high school districts being third. The simulated equity indices improved over the baseline indices for every year and across school district types. When comparing the simulated equity indices to the prior year there was quite a bit of improvement, especially

for unit school districts, for the simulations that eliminated the PTELL adjustment. The simulated indices showed more of a pattern of progress toward equity for unit and high school districts with elementary school districts progressing at a lesser degree.

Multiple regression. Some of the same findings were discovered for this measure as was seen in the previous equity measure. Unit school districts had the most equity in the school funding system with high school districts coming in third. The baseline equity indices were erratic for elementary and high school districts, but less so for unit school districts. Also, the simulated equity indices improved over the baseline indices for every year except for elementary school districts in 2009. Although the simulated equity indices improved over the baseline indices in the third simulation (elimination of GSA Hold Harmless) there was minimal impact on the values or improvement over the previous year.

However, there were some different patterns that emerged when analyzing the conditional wealth neutrality measure (change in R^2) for the simulations that eliminated the PTELL adjustment. When comparing the simulated indices to the prior year for unit school districts there were 6 years of improvement before fluctuating back and forth with decreases in 2007 and 2009. Also, high school districts had only 4 years (2001, 2003, 2006, and 2009) across all simulations where the equity indices improved over the prior year (baseline and simulated). Finally, when comparing simulated equity indices to the prior year for elementary school districts the change was from 3 years of improvement to 5 years (2002, 2005, 2007, 2008, and 2009).

Comparison across measures. Regardless of which equity measure was used unit school districts were always indicated to have the most equity in the school funding system and high school districts were always indicated to have the least equity. The simulations of eliminating the PTELL adjustment, GSA Hold Harmless component or combination of the two almost always resulted in the improvement of the equity indices. The few exceptions were either in the calculation for the McLoone Index or the simulation that only eliminated the GSA Hold Harmless.

CHAPTER V

SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Summary of the Study

Statement of the Problem

Funding of public school students in Illinois is not considered to be equitable. Many research studies have been conducted to gauge the level of equity in the Illinois funding system at various points in time during the past four decades. For the most part, the findings of the studies detailed in Chapter II reveal inequity in the Illinois funding structure. In Illinois, many committees/commissions/task forces have been created to study school funding. Although many reports have been produced, few of the proposed solutions have been implemented by the Illinois General Assembly. The overriding themes for the various funding reform proposals have been increased student equity, less reliance on local property taxes, and a greater adequate level of funding. Equity was the focus of this study because the Illinois General State Aid formula is based upon an equalization of state and local funds, and it was important to analyze how well that equalization factor works.

Purpose of the Study

The purpose of this study was to investigate the impact that the Property Tax Extension Limitation Law (PTELL) adjustment and the Hold Harmless

component of the General State Aid Formula have on the equity of the Illinois funding system. The timeline for the study was determined to be Fiscal Years 2000 to 2011.

Research Questions

1. What were the equity indices in the Illinois GSA funding system from Fiscal Year 2000 through Fiscal Year 2011 as computed by the four standard equity measures: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

2. When eliminating the PTELL adjustment in the Illinois GSA formula and holding the entitlement constant by increasing the foundation level, what are the equity indices in the GSA funding system from Fiscal Year 2000 through Fiscal Year 2011 as computed by the four standard equity measures: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

3. When eliminating the Hold Harmless component in the Illinois GSA formula and holding the entitlement constant by increasing the foundation level, what are the equity indices in the GSA funding system from Fiscal Year 2000 through Fiscal Year 2010 as computed by the four standard equity measures: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

4. When eliminating the PTELL adjustment and Hold Harmless component in the Illinois GSA formula and holding the entitlement constant by increasing the foundation level, what are the equity indices in the GSA funding system from Fiscal Year 2000 through Fiscal Year 2010 as computed by the four standard equity indices: McLoone Index, coefficient of variation, simple regression coefficient, and multiple regression change in the coefficient of determination (R^2)? What are the similarities and differences in the results?

5. What are the similarities and differences in the equity indices between and across the different simulations?

Summary of Methodology and Statistical Techniques

This study involved five major steps to address the research questions. In the first step, the GSA formula was calculated and then the equity indices were determined for each of the Fiscal Years from 2000 through 2011. This first step provided the baseline data for comparison purposes for each of the next four simulations. In step two, the PTELL adjustment in the GSA formula was eliminated and, while holding the entitlement constant, the foundation level was increased for each of the Fiscal Years 2000 through 2011. The specified equity indices were calculated. Step three eliminated the GSA Hold Harmless component of the GSA formula and, while holding the entitlement constant, the foundation level was increased for each of the Fiscal Years 2000 through 2010. The specified equity indices were calculated. Step four combined the elimination of both the PTELL adjustment and the GSA Hold Harmless component. The entitlement amount was held constant and the foundation level was increased for each of the Fiscal Years 2000 through 2010. Once again, the specified equity indices were calculated. Finally, in step five, all of the equity indices were compared across and within the various simulations and school district types.

Horizontal equity and equal opportunity (wealth neutrality and conditional wealth neutrality) were the two equity criteria analyzed in the study. The McLoone Index and coefficient of variation were the equity measures for analyzing horizontal equity. Wealth neutrality was measured using the regression coefficient from a simple regression. Finally, the change in R^2 from a multiple regression was used to measure conditional wealth neutrality.

Summary of Findings

Research Question 1

This question dealt with calculating the equity indices for the Illinois funding system over the specified time period. When analyzing data across all four equity measures and school district types that appear in Tables 6 through 9, some major findings emerge. Unit school districts consistently had the more equitable equity indices, with elementary school districts second, and high school districts least equitable. For the most part, elementary and unit school districts had equity indices that worsened over the 12-year time period across the four equity measures. High school districts had the least equitable indices over the four measures. However, the equity indices for high school districts improved over the 12-year period for all measures except for the conditional wealth neutrality.

There was not a clear pattern or trend in reviewing the equity indices for the 12-year period, four equity measures, and three school district types. It is logical that when the GSA foundation level did not increase in 2003 and 2011, the equity indices for the McLoone Index, coefficient of variation, and simple regression coefficient for all school district types worsened. However, there were other years, such as 2009, where the GSA foundation level did increase but the equity indices still worsened for all school district types (except high school districts for the simple regression coefficient). The change in R^2 for measuring conditional wealth neutrality was different than the other three measures. The indices worsened in 2003 for elementary school districts, 2009 for elementary

and unit school districts and all school district types in 2010 and 2011.

Generally unit school districts had the most compact range of values for each of the equity measures. High school districts tended to have the widest dispersion in the range of values for the equity indices. Although the indices across all four equity measures were generally more equitable for unit school districts and least equitable for high school districts, they tended to be erratic for all school district types.

Research Question 2

This simulation eliminated the PTELL adjustment in the GSA formula and increased the foundation level with the associated cost savings. The equity indices were calculated for the simulation and compared to the baseline equity indices from simulation one. When analyzing data across all four equity measures and school district types that appear in Tables 10 through 13, some major findings emerge. Unit school districts consistently had the most equitable simulated equity indices, elementary school districts second, and high school districts were least equitable. For the most part, elementary school districts had simulated equity indices that worsened across all four equity measures. Unit school districts had simulated equity indices that worsened over the 12-year period when analyzing the McLoone Index and coefficient of variation, but had improvement in the simulated indices for the simple and multiple regressions. High school districts had the least equitable simulated indices over the four measures. However, the equity indices for high school districts improved over the 12-year period for all measures except for the conditional wealth neutrality.

The main purpose of the second simulation was to determine the impact that the PTELL adjustment in the GSA formula had on equity in the Illinois funding system. Tables 10 through 13 contain the comparison of the simulated equity indices to the baseline indices. It can be seen that the simulated equity indices improved every year for all school district types for the coefficient of variation, simple regression coefficient and change in R^2. The simulated McLoone Index improved for all but 5 years (three for elementary school districts and one each for high school and unit school districts). Although some years the improvement in the simulated index was minimal, this simulation of eliminating the PTELL adjustment certainly moved the indices toward improved equity. Even though the equity indices progressed toward improved equity in the funding system, the erratic pattern of the values remained the same.

Research Question 3

This simulation eliminated the GSA Hold Harmless component and increased the foundation level with the associated cost savings. The equity indices were calculated for the simulation and compared to the baseline equity indices from simulation one. When analyzing data across all four equity measures and school district types, unit school districts consistently had the more equitable simulated indices, elementary school districts second, and high school districts least equitable. For the most part elementary school districts had equity indices that worsened across all four equity measures. Unit school districts had simulated equity indices that worsened over the 11-year period when analyzing the McLoone Index and coefficient of variation, but had

improvement in the simulated indices for the simple and multiple regressions. High school districts had the least equitable simulated indices over the four measures. However, the equity indices for high school districts improved over the 11-year period for all measures except for the conditional wealth neutrality.

The main purpose of the third simulation was to determine the impact that the GSA Hold Harmless component had on equity in the Illinois funding system. Tables 14 through 17 contain the comparison of the simulated equity indices to the baseline indices. Only for the simple regression coefficient did the simulated equity indices improve every year for all school district types. For the other three equity measures there were 1 or 2 years where there was no improvement for at least one of the school district types. Although for the most part the simulated equity indices improved, the improvement was minimal. This finding is not surprising because the associated cost of the Hold Harmless component ranged from only $19.6 to $65.8 million and therefore did not allow for large increases to the simulated GSA foundation level.

Research Question 4

This simulation eliminated the PTELL adjustment and GSA Hold Harmless component and increased the foundation level with the combined associated cost savings. The equity indices were calculated for the simulation and compared to the baseline equity indices from simulation one. When analyzing data across all four equity measures and school district types, unit school districts consistently had the more equitable simulated indices, elementary school districts second, and high school districts had the least equitable. For the most part elementary

school districts had simulated equity indices that worsened across all equity measures except for the simple regression coefficient. Unit school districts had simulated equity indices that worsened over the 11-year period when analyzing the McLoone Index, but for the most part had improvement in the coefficient of variation (except for 2010). Unit school districts also had improvement in the simulated equity indices for the simple and multiple regressions. High school districts had the least equitable simulated indices over the four measures. However, the equity indices for high school districts improved over the 11-year period for all measures except for the conditional wealth neutrality.

The main purpose of the fourth simulation was to determine the impact that the combination of the PTELL adjustment and the GSA Hold Harmless component had on equity in the Illinois funding system. Tables 18 through 21 contain the comparison of the simulated equity indices to the baseline indices. It can be seen that the simulated equity indices improved every year for all school district types for the coefficient of variation, simple regression coefficient and change in R^2. The simulated McLoone Index improved for all but 3 years (two for elementary school districts and one for high school districts). The simulated equity indices for unit school districts improved for every year across all equity measures. Although some years the improvement in the simulated index was minimal, this simulation of eliminating the PTELL adjustment and GSA Hold Harmless component certainly moved the indices toward improved equity. However, the erratic pattern of the values remained virtually the same.

Research Question 5

Research question five dealt with analyzing across the four simulations to find similarities and differences. In reviewing the data across the various simulations, equity measures and school district types there were a few patterns that emerged. Unit school districts always had the most equity in the funding system. Elementary school districts had more equitable indices than high school districts across all equity measures. However, when comparing the coefficient of variation the indices for the elementary and high school districts were much closer. The equity indices for elementary school districts seemed to be more erratic than the other district types, and high school districts tended to start off with worse equity and improve over time (except for the conditional wealth neutrality).

Even though the three simulations utilized a reallocation of state revenue in the GSA formula and no additional revenue the various equity measures improved across the school district types. This reinforces the idea that if funding equity is a goal of the state then analyses should be conducted to determine the progression of equity, especially when adjustments or components are added to the funding structure.

Conclusions

When baseline and simulated equity indices were compared across the equity measures the following conclusions were drawn.

1. Unit school districts were the most equitable across all measures and simulations.

2. The elimination of the Property Tax Extension Limitation Law adjustment in the General State Aid Formula had the largest positive impact on equity in the Illinois funding system.

3. The elimination of the General State Aid Hold Harmless component had only a small impact on equity in the Illinois funding system.

4. Greater equity gains were seen in wealth neutrality (weakening the relationship between revenue and wealth) compared to permissible variance (narrowing the disparity in district revenue).

Discussion

Several research studies have examined the impact that the 1973 funding reform had on equity in the Illinois funding system. When comparing the first 2 or 3 years of the implementation of the funding reform, the results were the same. Elementary school districts made little progress toward being more equitable compared to unit and high school districts. Unit school districts had the largest gains for wealth neutrality but did not have success on reducing the disparity in district expenditures. If the investigation stopped there it might be interpreted that the reform was a moderate success, at least for some measures and school district types. However when reviewing the long-term effects of the reform as Hickrod, Chaudhari, and Hubbard (1985) did from 1973 through 1986 and Hickrod and Chaudhari (1997) extended to 1997, a different picture emerges. The values for the various measures tended to be erratic, and at the end of 1986 elementary school districts had lost any equity gains that had been seen in the first 2 years. Unit and high school districts managed to retain a small amount of

the gains that had been made under the Resource Equalizer formula. However, when the equity study was extended out to 1997 all school district types became less equitable with respect to the coefficient of variation, Gini Index, and regression coefficient. The McLoone Index was the only measure where unit and high school districts had some progress toward equity from 1973 to 1997 but elementary school districts started to decline every year from 1988 to 1997.

There was another push for school funding reform in the early 1990s, and in 1997 a new general funding formula was enacted and implemented in 1999. However this time there did not seem to be the same flurry of research to investigate the equity impact of the new formula as in the mid-1970s. One reason may have been the elimination of the Illinois School Problems Commission. For 40 years (1945 to 1985) the Illinois School Problems Commission led the way to researching educational problems including school funding equity and now there was no such group. The 1997 reform created the Education Funding Advisory Board but the responsibilities were limited to recommendations on the GSA foundation level and poverty grant every other year. When legislators implemented a new formula in 1973 to distribute state aid, there was a directive to evaluate the new formula. By 1977 there had been three annual evaluations of the state goals for funding equity. In 1997 there was no provision that stipulated annual evaluations of the funding system.

The Center for the Study of Educational Finance at Illinois State University began studying the Illinois finance system in 1972. By 1997 there were 25 years of analysis regarding the equity measures of permissible variance and wealth

neutrality. No studies were found that analyzed equity for the last year (1998) of the 1973 reform or the new funding formula from 1999–2004. However, the Illinois State Board of Education staff calculated various equity indices annually. These were included in an appendix of the State, Local and Federal Financing for Illinois Public Schools report. The last time the report was created was 2000 and can be found at http://www.isbe.net/sfms/html/financial_archive.htm. Mullin and Brown (2009) and Verstegen and Driscoll (2008 and 2009) conducted equity studies utilizing data for 2005. Although the purpose of this study was to evaluate how the GSA Property Tax Extension Limitation Law adjustment and Hold Harmless component impacted equity, it also provided a longitudinal study of the funding reform of 1997. This secondary purpose allowed a comparison of three common equity measures (coefficient of variation, McLoone Index, and simple regression coefficient) of this study to Hickrod and Chaudhari (1997).

Simulation one of this study was the calculation of baseline equity indices for 2000 to 2011. There were some similarities and differences in the results of this study of the funding system of the 1997 reform compared to the 1973 reform study by Hickrod and Chaudhari (1997). The discussion is organized by equity measure. The coefficient of variation measures the disparity of district revenues. In both studies unit school districts were more equitable than the other district types. In Hickrod and Chaudhari (1997), high school districts were more equitable than elementary school districts for the first 20 years but became less equitable in 1993. Also, all school district types lost any progress toward equity by the last year of the study. However, this study found that high school districts

were less equitable than elementary school districts for the first half of the study and then it reversed. Also, high school districts retained some of the equity gain while unit and elementary school districts lost all equity gains by 2011.

The McLoone Index measures equity for the bottom half of the distribution. Once again both studies indicated that unit school districts were more equitable but also found that high school districts had the worst equity. Hickrod and Chaudhari (1997) found that unit and high school districts retained some of their equity gains over the 25-year period but elementary school districts ended the period less equitable. The results of this study also showed that high school districts retained some of the equity gain but that unit and elementary school districts lost any gain made during the time period.

The simple regression coefficient was used to measure the relationship between district revenue and wealth. This measure is used to gauge wealth neutrality (equal opportunity) and the weaker the relationship between revenue and wealth the more equity of the funding system. Both studies indicated that unit school districts were most equitable while high school districts were least equitable. Hickrod and Chaudhari (1997) found that all district types lost the equity gains that had been made. Elementary school districts lost their equity gains by 1981, high school districts by 1992, and unit school districts did not lose until 1997. This study had differing results because high school districts had equity gains every year (the index in 2011 increased a slight amount) and ended the period more equitable. Unit school districts had equity gains over the period, but there were some irregular patterns and in 2011 had lost all of the increased

equity. Except for a few years, the relationship between revenue and wealth became increasingly stronger for elementary school districts, which ended at the strongest level in 2011.

The findings of both studies indicated that unit school districts had less disparity of district revenue, less disparity in the bottom half of the population, and a weaker relationship between district revenue and wealth than the other district types. Also, elementary school districts had more irregular indices and the small amount of gain in equity was lost by the end of the time period for both studies.

The main difference of the two studies was the time period. This study was conducted for a 12-year period, and Hickrod and Chaudhari (1997) was conducted for a 25-year period. However, there was also a difference in the disparity in revenue for high school districts. Revenue disparity decreased for high school districts under the 1973 reform for 16 years before increasing and ultimately losing all of the gain made. Also, for 20 years the high school districts had less disparity (more equity) in district revenue than elementary school districts. However, that differed from the findings of this study because for the first 6 years high school districts had more disparity (less equity) than elementary school districts and then the last 6 years it reversed. Also, this study indicated that high school districts retained some of their equity gains. If the current funding formula continues it would be interesting to analyze the additional years to see if more patterns emerge between the two studies.

This study added to the research on school funding equity in two ways. First there was examination of how two specific adjustments to the funding formula affected equity of the Illinois funding system. This study may provide baseline data to aid in the discussion of "new" funding reform especially when thinking about adjustments or revisions to a formula. Also, this study provides a basis for a continued longitudinal study as was seen from 1973 to 1997. Dr. Hickrod was involved in many research studies that began with a study of two points in time and eventually expanded out to 25 years. If the current funding formula stays intact, this study could provide that same basis and be extended over the years to provide more valuable data regarding equity in the Illinois funding system.

Policy and Future Research Recommendations

Policy Recommendations

1. Based on the findings that equity improved in the Illinois funding system when the PTELL adjustment and GSA Hold Harmless component were eliminated (and the cost savings used to increase the foundation level), the legislators should devise a system that will annually review the equity progress of the funding system. This will allow policymakers to make informed decisions when modifying the general funding system to assure new initiatives do not negatively affect equity.

2. Whenever a new funding formula is implemented the legislators typically include a hold harmless provision. However this study found that the GSA Hold Harmless component had a negative effect on equity in the Illinois

funding system. Therefore if the legislators believe in school funding equity, then any hold harmless provision needs to have a time limit so there will be minimal impact on equity.

Recommendations for Future Research

1. In this study the equity indices improved most under the simulations where the PTELL adjustment was eliminated, but the indices might still not be considered to be in acceptable ranges. A future study could expand simulation two to investigate how much additional state revenue would need to be added to the General State Aid formula to move the equity indices into acceptable ranges.

2. There were very different ranges for the equity indices by school district type. A future study could investigate why the Illinois funding system has such varying effects on equity across school district type. This data will help improve the Illinois funding system to provide equity across school district types.

3. Analysis from this study indicated erratic patterns of equity indices within school district type. A future study could replicate simulation one but add another level of analysis within school district type. The subgroups would be school districts that are subject to PTELL versus school districts not subject to PTELL. This analysis would determine if the subgroups (PTELL versus non-PTELL) are affected differently by equity in the Illinois funding system and whether the erratic patterns are seen in each subgroup.

4. A research study by Hickrod and Chaudhari (1997) added to previous research and provided 25 years of equity analysis of the funding structure enacted in 1973. This study spanned 12 years but, because the focus was on

the PTELL adjustment and GSA Hold Harmless component, did not begin with the first year of the formula (1999). A future study could add 2 years to the beginning of this study and start in 1998 (the year before the new formula) for simulation one which was the baseline equity indices. There could also be additional years added to the end of this study. In 2012 to 2014 the General State Aid foundation level was retained at $6,119 but General State Aid was prorated each year due to decreased appropriations. A decision would have to be made as to how to calculate the equity indices for these years when General State Aid was prorated. The addition of these years would allow a more complete comparison to the 1973 reform longitudinal study.

5. This current study did not examine the role of the poverty grant on the equity indices. Similar to the GSA Hold Harmless component, the poverty grant formula is not part of the equalization component of the GSA formula. Furthermore, in FY 1999 low-income students were funded through a separate formula rather than included through weighting in the General State Aid (GSA) formula. Also, in FY 2004, the low-income count of the formula changed from utilizing the decennial Census to an annual count from the Department of Human Services and the formula was revised. Yet, comparing FY 2011 to FY2004, the low-income count in Illinois has increased by 71% and the poverty grant increased by 222% ($418,385,465 to $1,349,108,591). Future research could investigate the impact that the poverty grant has on equity of the Illinois Funding System overall and by the percentage of low-income students in school districts.

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APPENDIX A

SPENDING PER PUPIL BY SCHOOL DISTRICT TYPE

OPERATING EXPENDITURE PER PUPIL BY SCHOOL DISTRICT TYPE: MINIMUM, MAXIMUM, AND AVERAGE

	Elementary			High School			Unit		
Year	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
2000	$3,987	$17,871	$6,959	$5,644	$17,911	$10,765	$4,092	$11,688	$7,124
2001	$4,297	$18,225	$7,442	$5,970	$17,636	$11,167	$4,610	$11,726	$7,546
2002	$4,340	$18,193	$7,740	$6,509	$17,291	$11,442	$4,753	$10,824	$7,771
2003	$4,829	$20,173	$8,125	$6,310	$17,407	$11,593	$4,894	$14,741	$8056
2004	$4,438	$23,799	$8,362	$6,917	$17,704	$11,850	$5,042	$11,967	$8,384
2005	$4,281	$22,508	$8,763	$6,766	$18,001	$12,004	$5,060	$28,285	$8,676
2006	$5,144	$22,050	$9,111	$6,958	$18,592	$12,365	$5,148	$20,841	$9,078
2007	$5,122	$23,001	$9,517	$4,803	$18,808	$12,708	$5,486	$23,726	$9,515
2008	$5,522	$22,778	$10,034	$6,860	$20,867	$13,272	$6,009	$31,226	$10,006
2009	$5,922	$23,449	$10,633	$8,211	$23,789	$14,260	$6,211	$26,660	$10,821
2010	$6,174	$24,244	$11,082	$8,651	$22,489	$14,686	$6,383	$24,633	$11,370
2011	$6,009	$25,355	$11,190	$8,799	$26,225	$14,681	$6,061	$22,561	$11,262

Note. Data obtained at http://webprod1.isbe.net/ilearn/asp/index.asp

APPENDIX B

HISTORY OF CPI USED FOR THE PROPERTY TAX EXTENSION LIMITATION LAW (PTELL)

CONSUMER PRICE INDEX (CPI) USED FOR THE PROPERTY TAX EXTENSION LIMITATION LAW

Levy Year	Calendar Year	Consumer Price Index
1993	1992	2.9%
1994	1993	2.7%
1995	1994	2.7%
1996	1995	2.5%
1997	1996	3.6%
1998	1997	1.5%
1999	1998	1.6%
2000	1999	2.7%
2001	2000	3.4%
2002	2001	1.6%
2003	2002	2.4%
2004	2003	1.9%
2005	2004	3.3%
2006	2005	3.4%
2007	2006	2.5%
2008	2007	4.1%
2009	2008	0.1%
2010	2009	2.7%
2011	2010	1.5%
2012	2011	3.0%

Note. Data obtained from http://www.revenue.state.il.us/LocalGovernment/PropertyTax/CPIhistory.pdf

APPENDIX C

ILLINOIS COUNTIES SUBJECT TO THE PROPERTY TAX EXTENSION LIMITATION LAW

ILLINOIS COUNTIES THAT HAD LEGISLATION OR A REFERENDUM REGARDING THE PROPERTY TAX EXTENSION LAW

County	Year Subject to PTELL	Year Referendum Failed
Adams		1997
Boone	1997	
Bureau		1998
Carroll		1997
Champaign	1997	
Christian	1997	
Coles	2003	
Cook	1994	
Cumberland	2003	
Dekalb	2000	
Dupage	1991	
Edgar		2001
Franklin	1997	
Greene	2001	
Jackson	1997	
Jefferson	1999	
Jo Daviess	1998	
Kane	1991	
Kankakee	1997	
Kendall	1998	
La Salle		1997
Lake	1991	
Lee	1997	
Livingston	2000	
Logan	1997	
Macoupin	1997	
Madison		1999
Marion	1999	
Massac	2001	
McDonough	1998	
McHenry	1991	
McLean		1997
Menard	1997	
Monroe	1997	
Morgan	1997	2003
Moultrie		2003
Randolph	1997	
Sangamon	1997	
Schuyler	1997	
Shelby	2001	
Stephenson	1998	
Tazewell	1999	
Union	1997	
Washington	1999	
Whiteside		1997
Will	1991	
Williamson	1997	
Winnebago	1997	

Note. Data obtained at http://www.revenue.state.il.us/LocalGovernment/PropertyTax/PTELLcounties.pdf